

**SONY®**

DISK UNIT

**BKNW-116**

MAINTENANCE MANUAL

1st Edition (Revised 1)

Serial No. 10001 and Higher (SY)

Serial No. 30001 and Higher (J)

## 警告

このマニュアルは、サービス専用です。

お客様が、このマニュアルに記載された設置や保守、点検、修理などを行うと感電や火災、人身事故につながる可能性があります。

危険をさけるため、サービストレーニングを受けた技術者のみご使用ください。

## **WARNING**

This manual is intended for qualified service personnel only.

To reduce the risk of electric shock, fire or injury, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so. Refer all servicing to qualified service personnel.

## **WARNUNG**

Die Anleitung ist nur für qualifiziertes Fachpersonal bestimmt.

Alle Wartungsarbeiten dürfen nur von qualifiziertem Fachpersonal ausgeführt werden. Um die Gefahr eines elektrischen Schlages, Feuergefahr und Verletzungen zu vermeiden, sind bei Wartungsarbeiten strikt die Angaben in der Anleitung zu befolgen. Andere als die angegeben Wartungsarbeiten dürfen nur von Personen ausgeführt werden, die eine spezielle Befähigung dazu besitzen.

## **AVERTISSEMENT**

Ce manuel est destiné uniquement aux personnes compétentes en charge de l'entretien. Afin de réduire les risques de décharge électrique, d'incendie ou de blessure n'effectuer que les réparations indiquées dans le mode d'emploi à moins d'être qualifié pour en effectuer d'autres. Pour toute réparation faire appel à une personne compétente uniquement.

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# Manual Structure

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## Purpose of this manual

This manual is the maintenance manual of disk unit BKNW-116.  
This maintenance manual is intended for use by trained system and service engineers, and provides the information that premises the parts level service (parts replacement, schematic diagrams, board layouts, parts list).

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## Contents

This manual is organized by following sections.

### **Section 1 Service Overview**

Explains the information that is required to service (location of main parts, fixtures list, removal of cabinet).

### **Section 2 Replacement of Main Parts**

Explains the replacement of hard disk drives, power supply, and boards.

### **Section 3 Spare Parts**

Describes the exploded views, mechanical parts list, electrical parts list, and supplied accessories list.

### **Section 4 Semiconductor Pin Assignments**

Describes the semiconductor pin assignments.

### **Section 5 Block Diagram**

Describes the block diagram of overall.

### **Section 6 Schematic Diagrams and Frame Wiring**

Describes the schematic diagrams and frame wiring.

### **Section 7 Board Layouts**

Describes the board layouts.

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## Related manuals

Besides this “maintenance manual”, the following manuals are available for disk unit BKNW-116.

- **Operation manual (Supplied with BKNW-116.)**

This manual is necessary for application and operation of the BKNW-116.

- **Installation manual (Supplied with BKNW-116.)**

This manual describes the information that is required to install.

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## Trademarks

Trademarks and registered trademarks used in this manual are follows.

- Scotch is trademark of 3M corporation in the U.S.A.



## Caution for Handling the Unit with Built-in HDD

This unit has built-in hard disk drives (HDDs). Pay careful attention to the following and operates with care when installing, servicing, and performing the maintenance of this unit.

---

### Never give any mechanical shock and vibration.

This may cause an HDD trouble or destroy the data in HDD.

- Pack this unit using specified packing materials when carrying the unit. Use a cart with less-vibration when carrying this unit by a cart. If an excessive mechanical shock and vibration are applied, the HDD may be damaged.
- Never move this unit under the power-on state. Take out or insert this unit from/to the rack under the power-off state. Also never install or remove the cabinet under the power-on state.
- When this unit is in a vehicle, never turn on the power during running.
- When putting the unit on the floor, put this unit gently with the four specified feet which is attached to the bottom of the unit on the floor. If there are no feet on the bottom, attach them before putting this unit, or put this unit gently so that no sound is generated.

---

### Never operate the unit for 30 seconds after the power is turned off.

The disks in HDD rotate by inertia for a while after the power is turned off. In this case, the heads are in the unstable state. During this period, the HDD is more sensitive to a mechanical shock and vibration than during power-on state. Never give even a slight shock at least 30 seconds after the power is turned off. Operations can be initiated after 30 seconds or more because the disks stop.

---

### In the event of trouble in HDD

If there is something wrong with the HDD of this unit or a failure occurs in the HDD, handle this unit in the same manner as described above. This protects the HDD from increase of the damage till confirming the contents of the failure or analyzing the failure.

Pay careful attention to the following when handlings the HDD alone.

---

### Notes when carrying or keeping the HDD

Pack the HDD using the specified packing materials when carrying or keeping the HDD. Moreover, choose the method which the HDD is not subject to the vibration when carrying.

---

## Notes when replacing the HDD

Follow the procedure (described in Section 2) when replacing the HDD.

- If an excessive mechanical shock and vibration are applied, the unpacked HDD may be damaged. Place the unpacked HDD in a horizontal position (with the printed board side up) . Moreover, it is recommended that the unpacked HDD is put on the specified HDD cushion.
- Use the specified shockless torque screwdriver when tightening and removing the screw during replacing the HDD.

The HDD cushion and shockless torque screwdriver are available as a fixture.

HDD cushion : Part No. J-6530-060-A

Shockless torque screwdriver : Part No. J-6530-070-A

- HDD is easily affected by static electricity. Take measures against static electricity such as establishing a ground, then install the HDD.

---

## Handling of failed HDD

Handle the HDD that is removed because of a trouble or failure in the same manner as a normal HDD following above precautions. Then pack the HDD using the specified packing materials, contact your local Sony Sales Office/Service Center.



# Section 1

## Service Overview

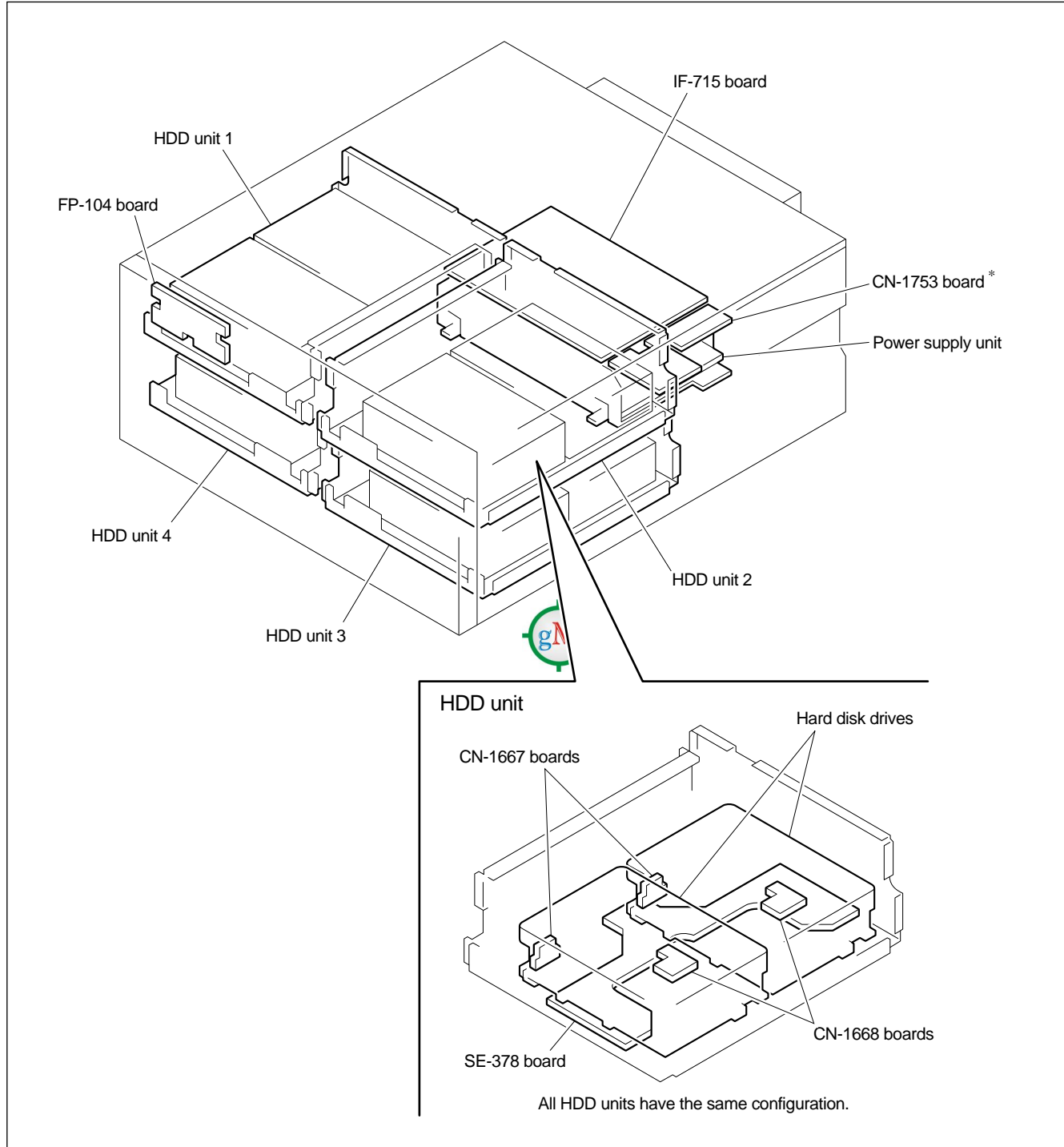
### 1-1. Notes on Power Supply Block

#### **WARNING**

The primary side circuit of this unit consists of AC inlet, POWER switch and power supply unit. Take care to avoid electric shock when carrying out the maintenance and service while electricity is conducted.

Even if POWER switch is turned OFF, primary side voltage is applied to POWER switch. Therefore, in case of work which does not require electricity, turn off the POWER switch and then pull out the power cord before starting the work.

## 1-2. Main Parts Location



\* : CN-1753 board is applicable to only the units which serial No. is 10001 through 10052.

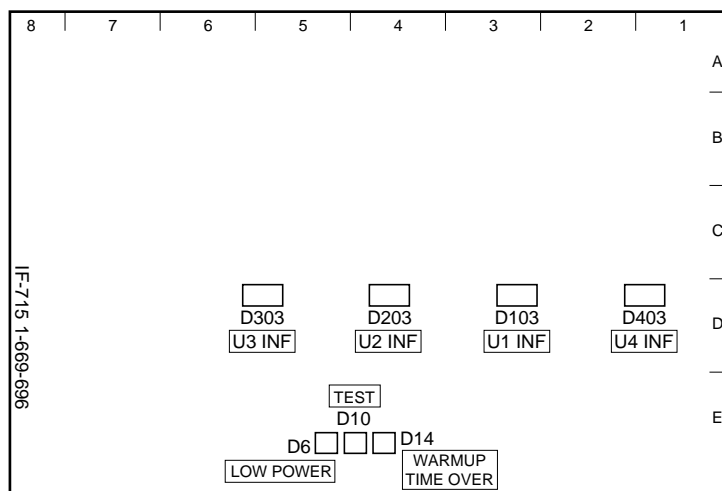
## 1-3. LED on Circuit Board

This section explains the LEDs on the board.

### 1-3-1. FP-104 board

There are four LEDs on the FP-104 board. These LEDs are the four indicators (POWER, BUSY, WARM-UP, ALARM) on the front panel. Refer to “Location and Function of Parts” of the operation manual for details.

### 1-3-2. IF-715 Board



< Connector panel side >

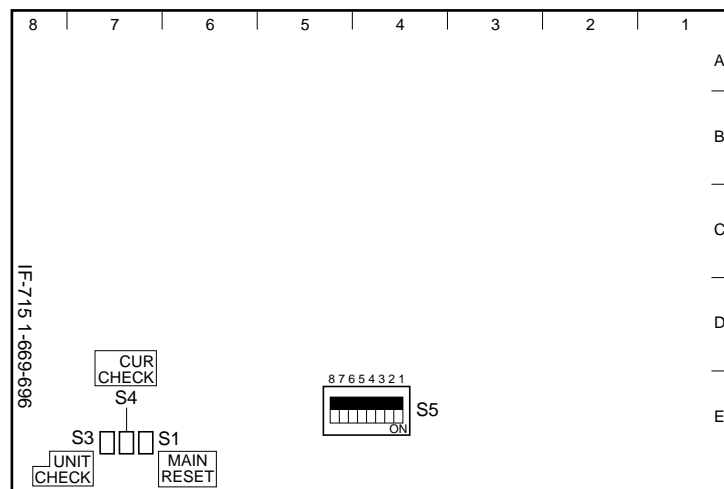
LED No.	Name	Light color	Description
D6	LOW POWER	Red	Lights up when momentum power failure occurs on power supply system. (It might have an effect on the performance of HDD.)
D10	TEST	Red	Lights up when any of 4 to 8 of DIP switch (S5) are on.
D14	WARMUP TIME OVER	Red	Lights up when peripheral temperature of HDD doesn't rise over 5°C even if warm up is carried out for approx. 30 min.
D103	U1 INF	Red	Lights up when over current is detected in warm up circuit of HDD unit 1 (SE-378 board).
D203	U2 INF	Red	Lights up when over current is detected in warm up circuit of HDD unit 2 (SE-378 board).
D303	U3 INF	Red	Lights up when over current is detected in warm up circuit of HDD unit 3 (SE-378 board).
D403	U4 INF	Red	Lights up when over current is detected in warm up circuit of HDD unit 4 (SE-378 board).

## 1-4. Switch on Circuit Board

### 1-4-1. IF-715 Board

**Note**

Never change the settings of factory use switches.



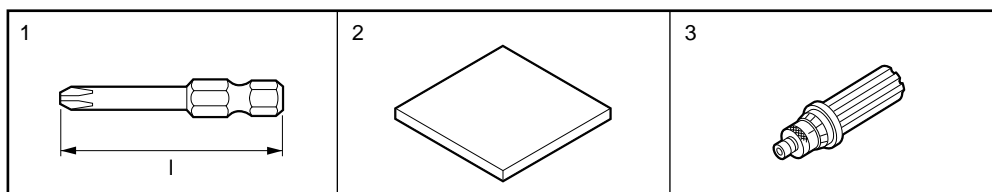
< Connector panel side >

Switch No.	Name	Contents	Factory setting
S1*	MAIN RESET	To reset circuit on IF-715 board. (Reset period is approx. 2 seconds.)	—
S3*	UNIT CHECK	During pressing this switch, the LEDs (D103, D203, D303, D403) on the IF-715 board light up.	—
S4*	CUR CHECK	During pressing this switch, reference voltage of current detection circuit on SE-378 board changes from 2 V (normal) to 0.5 V. (Being able to check that current is flowing to heat up device of SE-378 board.)	—
S5 1	—	Factory use	OFF
4			
5	TEMP TEST	ON: To set all units at low temperature and at the same time set the period of timer at approx.10 seconds. (So that processing of all units at low temperature and time over processing can be checked.) OFF: Normal state	OFF
6	FAN TEST	ON: To set at fan abnormal state. (So that ALARM and ERROR information notice to host can be checked in relation to the fan.) OFF: Normal state	OFF
7	WU TEST	ON: To set at WARMING UP ERROR state. (So that ALARM and ERROR information notice to host can be checked in relation to the fan.) OFF: Normal state	OFF
8	HDD CUT OFF	ON: ERROR information notice to host is fixed as no error/alarm state (WARMUP=Hi and ERROR=Lo). (So that various investigations can be carried out while connected to the host.) OFF: Normal state	OFF

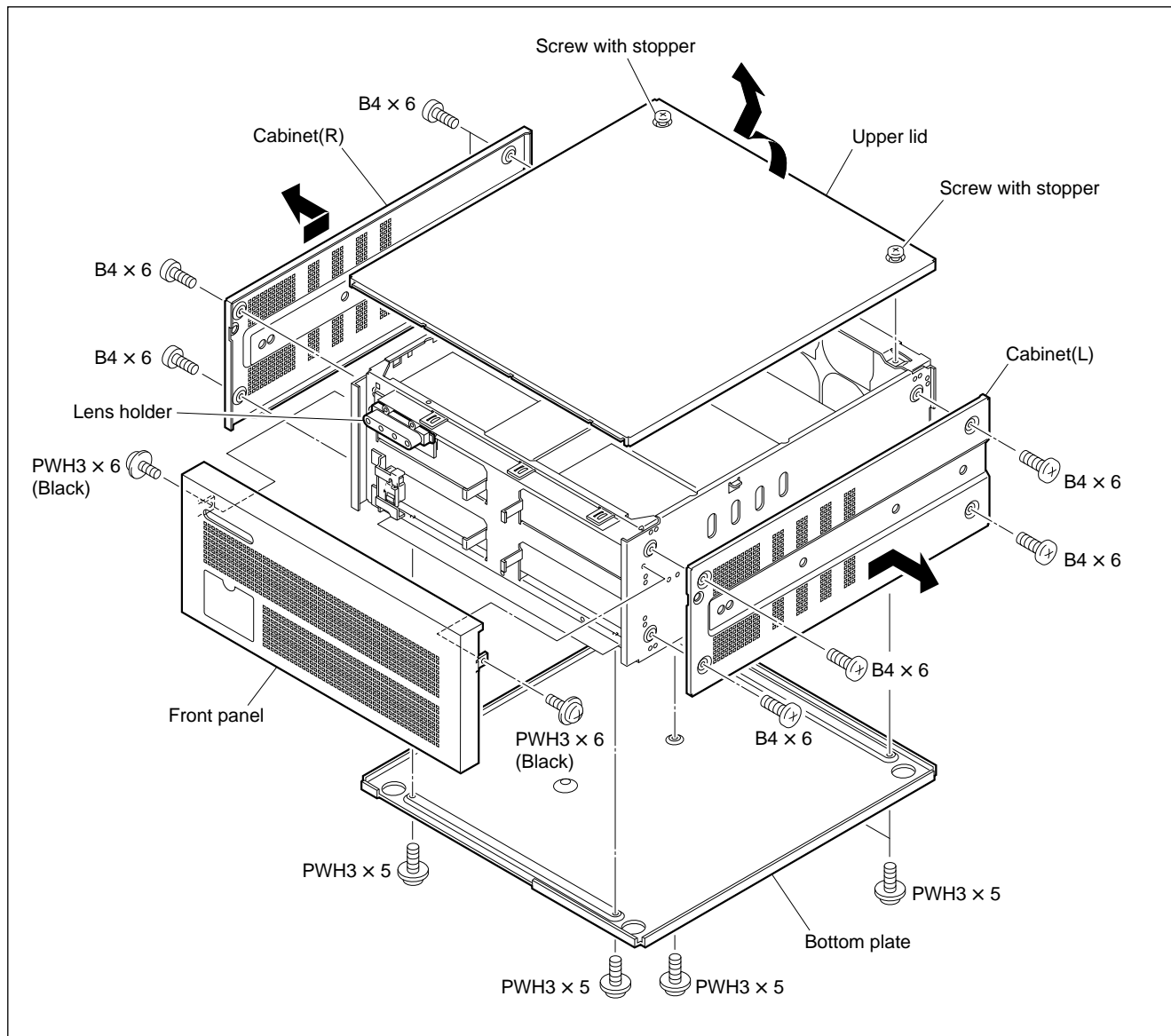
\* : S1, S3 and S4 are push switches.

## 1-5. Fixtures

Fig. No.	Parts No.	Name	Usage
1	J-6323-430-A	Torque driver's bit (+3 mm, l = 90 mm)	Tightening screws
2	J-6523-060-A	HDD cushion DF-006	Replacement work of HDD
3	J-6530-070-A	Schockless torque screwdriver 1.2 N·m (12 kgf·cm) DF-007	Tightening screws for installation HDD



## 1-6. Removal/Installation of Cabinet



**CAUTION**

Be careful not to catch your finger or hand in rack mount rail when installing and pulling out this unit which has rack-mounted.

**Note**

Turn off the power and pull out the power cord before starting the work.

---

**Upper Lid**

- (1) Loosen the two screws (B4 × 8) with stopper properly.
- (2) Lift up connector panel side of the upper lid and pull it out towards the direction of the arrow.

Attach it in the reverse order of procedure for removal.

**Note**

Attach the upper lid so that the convex part of the front panel side of upper lid is inserted into the front panel and press it.

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**Cabinet (L) and (R) (Same for right and left)**

- (1) Remove the four screws (B4 × 8) and remove side panel.

Attach it in the reverse order of procedure for removal.

**Note**

Attach the cabinet so that the cabinet is engaged to the bending portion on rear-end of the chassis.

---

**Front panel**

- (1) Remove the two screws (PWH3 × 6) and remove the front panel.

Attach it in the reverse order of procedure for removal.

**Note**

Attach while adjusting so that the lens holder is inserted in the hole of the front panel.

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**Bottom Plate**

**Note**

Pay sufficient attention to avoid subjecting the hard disk drive to shock.

- (1) Place the unit with the side facing downwards.
- (2) Remove the five screws (PWH3 × 5) and remove the bottom plate.

Attach it in the reverse order of procedure for removal.

## 1-7. Periodic Check of Filter

When dust is attached to the filter on the front panel and air flow is obstructed, temperature inside the unit rises. It may cause of reduction in performance or life of this unit. Check the filter periodically, and clean it if the dust attaches on it. Moreover, it is recommended to replace the filter if it is damaged.

### 1-7-1. Cleaning

When dust is attached to the filter, clean the filter.

**Note**

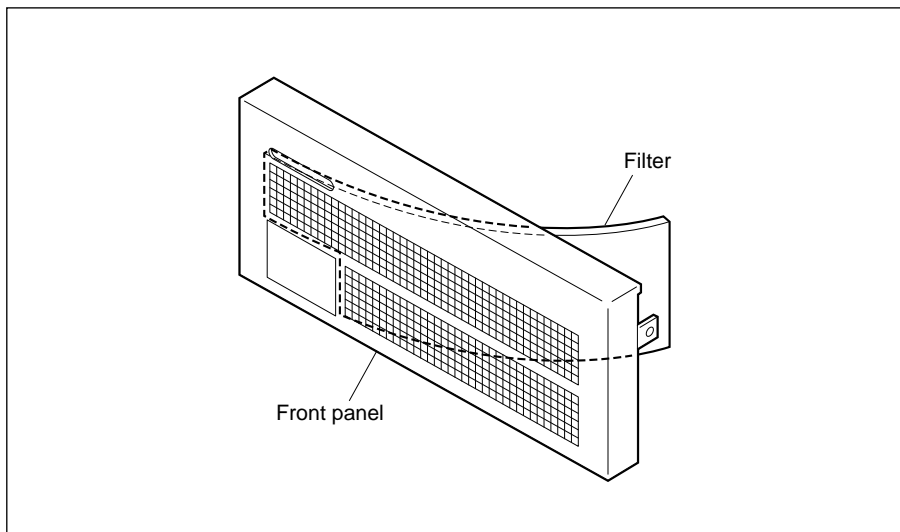
Be sure to turn off the power before cleaning.

- (1) Remove the front panel. (Refer to Section 1-6.)

**Note**

Front chassis might be hot. So be careful not to touch it.

- (2) Remove the filter from the front panel.



- (3) Remove the dust on the filter using a vacuum cleaner.

**Note**

Be sure to remove the filter from the front panel before cleaning.

- (4) Attach the filter on the front panel.
- (5) Attach the front panel.

### 1-7-2. Replacement

It is recommended to replace the filter if it is damaged.

Remove the damaged filter and replace with the new one referring to Section 1-7-1.



## 1-8. Measures when ALARM Indicator Lights up

If a fault is detected in this unit, ALARM indicator lights up or blinks. Moreover, WARMING UP indicator also lights up by a type of fault.

ALARM	WARMING UP	Problem	Measures *1
Slow blinking (approx.1 sec. intervals)	Stays unlit	Cooling fan fault	①
Fast blinking (approx.0.1 sec. Intervals)	Stays unlit	Warm up circuit over current detected	②
	Lights up	Temperature is so low that the peripheral temperature of HDD does not rise over 5 °C in approx. 30 minutes.	③
Slow blinking and fast blinking lternate *2	Stays unlit	Both cooling fan fault and warm up circuit over current detected.	④
	Lights up	Cooling fan fault and temperature is so low that the peripheral temperature of HDD does not rise over 5 °C in approx. 30 minutes.	⑤
Light up	Stays unlit	Instantaneous power supply failure	⑥

\*1: The handling methods is explained below.

\*2: Repeatedly lights up for 1 sec., then blinks 0.1 sec. interval for 1 sec.

### In the Case of ①

This error does not effect performance itself just after occurrence. However, if the unit is used continuously in this state, HDD might be damaged due to increase internal temperature.

- (1) Stop the operation of the hybrid recorder to abort the access to BKNW-116.
- (2) Turn off the power of this unit and the hybrid recorder.
- (3) Remove the upper lid to check the fans of inside of this unit.
- (4) Check that all fans rotate after turning on the power.
- (5) When the cause is found, turn off the power of this unit and hybrid recorder.
- (6) Measure to recover from the error, then turn on the power again.

### In the Case of ②

At that time, LED on the IF-715 board lights up. Therefore, we can check that a fault is detected in warm up circuit of which HDD unit. (Refer to “1-3-2. IF-715 Board”)

This error does not effect performance itself just after occurrence. However, if the unit is used continuously in this state, HDD might be damaged due to increase internal temperature.

- (1) Identify the abnormal HDD unit by the LEDs on the IF-715 board.
- (2) Check the circuit of SE-378 board of relevant HDD unit.

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### In the Case of ③

#### Note

At that time, LED (D14) on the IF-715 board lights up.

- (1) Check that the temperature in the operating condition is within the performance guarantee range.  
(Refer to Section 1-3 of the installation manual for operating condition.)
- (2) When the cause is found, turn off the power of this unit and hybrid recorder.
- (3) Measure to recover from the error, then turn on the power again.

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### In the Case of ④

Take corrective action both ① and ②.

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### In the Case of ⑤

Take corrective action both ① and ③.

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### In the Case of ⑥

#### Note

At that time, LED (D6) on the IF-715 board lights up.

- (1) Turn off the power of this unit and hybrid recorder.
- (2) Check the power supply line (power supply cable, POWER switch, supply power voltage, etc.).
- (3) Measure to recover from the error, then turn on the power again.

## 1-9. Notes on Repair Parts

### 1. Safety Related Components Warning

Components marked  $\triangle$  are critical to safe operation. Therefore, specified parts should be used in the case of replacement.

### 2. Standardization of Parts

Some repair parts supplied by Sony differ from those used for the unit. These are because of parts commonality and improvement.

Parts list has the present standardized repair parts.

### 3. Stock of Parts

Parts marked with “o” at SP (Supply Code) column of the spare parts list may not be stocked.

Therefore, the delivery date will be delayed.

### 4. Units Representation

The following represented units are changed or omitted in writing.

Units		Representation
Capacitance	$\mu\text{F}$	uF
Inductance	$\mu\text{H}$	uH
Resistance	$\Omega$	Abbreviation
Temperature	$^{\circ}\text{C}$	XXX-DEG-C

### 5. Destination Representation

The part indicated “For J/SY” in the spare parts list is used in the unit written below.

For J : The part is used in a unit for Japan.

For SY : The part is used in a unit except Japan.

### 6. Notes when Carrying or Keeping the HDD

Pack the HDD using specified packing materials when carrying or keeping the HDD. Moreover, choose the method which the HDD is not subject to the vibration when carrying.

### 7. Notes when Replacing the HDD

- If an excessive mechanical shock and vibration are applied, the unpacked HDD may be damaged. Place the unpacked HDD in a horizontal position (with the printed board side up). Moreover, it is recommended that the unpacked HDD is put on the specified HDD cushion.
- The HDD is easily affected by static electricity. Take measures against static electricity such as establishing a ground, then install the HDD.

### 8. Handling of failed HDD

Handle the HDD that is removed because of a trouble or failure in the same manner as a normal HDD following above precautions 6 and 7. Then pack the HDD using the specified packing materials, contact your local Sony Sales Office/Service Center.



## Section 2

### Replacement of Main Parts

This section explains methods of replacing the following parts.

- Hard disk drive
- Power supply unit
- Circuit board

For other parts, refer to Section 3-1 (Exploded Views).

#### CAUTION

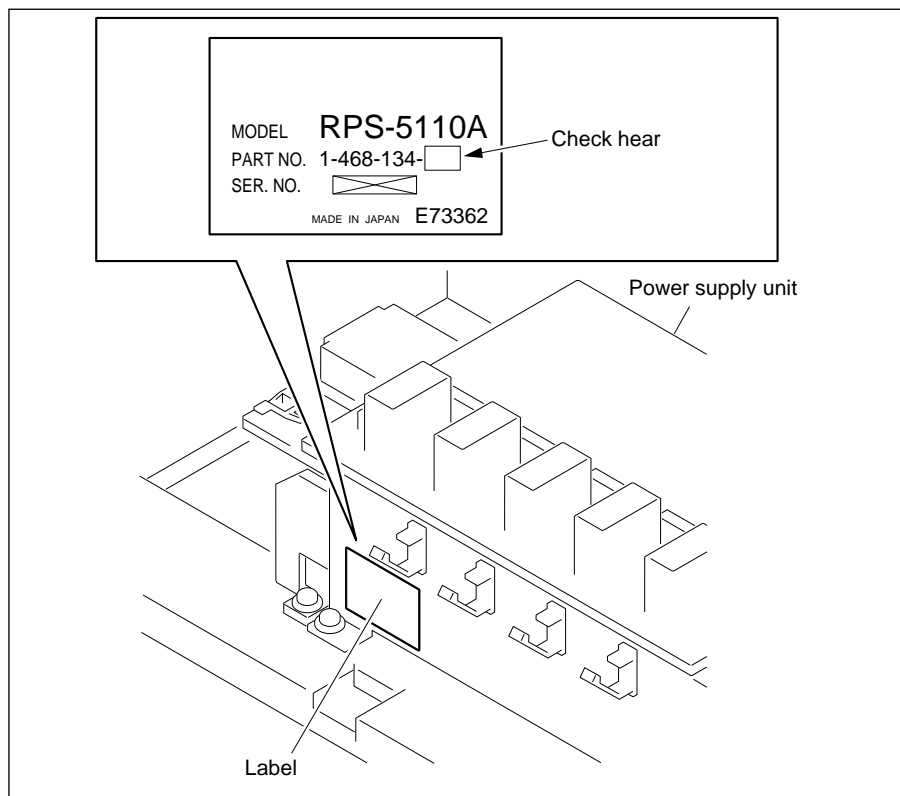
- Turn off the power and wait till this unit cools when replacing the fans.
- Turn off the power and wait till a heat up device cools when replacing HDDs or its peripheral parts.

### 2-1. Note on Replacing the Parts

1. The method of parts replacement differs according to a number of power-cooling-fan.

Serial No.	Number of fan
10001 through 10052	2
10053 and higher	1

2. The power supply unit of suffix -12 (part No.: 1-468-134-12) does not subject to repair. When this power supply unit of suffix -12 has broken down, replace the power supply unit of suffix -12 with the one of suffix -13 and higher. For the part No. of power supply unit, check the label affixed to the portion shown in the figure.



## 2-2. Replacement of Hard Disk Drive

### 2-2-1. Notes on Handling Hard Disk Drive

Handle the HDD unit and hard disk drive carefully following “Caution for Handling the Unit with Built-in HDD”. (Mentioned after “Manual Structure”.)

If the hard disk drive suffers some operational malfunction, pack it carefully with the specified packing material, then contact your local Sony Sales Office/Service Center.

- HDD cushion

It is strongly recommended to use a HDD cushion to protect the removed hard disk during replacing.

- Shockless torque screwdriver

During replacing the hard disk drive, be sure to use a shockless torque screwdriver for tightening all screws. If the former ratchet type torque driver is used, vibration caused at idle rotation might damage the hard disk drive.

In the case of a shockless torque screwdriver, when the tightening torque reaches the set value, it rotates idle at approx. 90°. At the instant of idle of the driver, stop tightening screw.

### 2-2-2. Removal/Installation of HDD Unit

This section explains the methods for removal and installation of HDD unit in the BKNW-116. For the method for removal of the hard disk drive from HDD unit and replacement it, refer to “2-2-3. Removal/Installation of Hard Disk Drive”.

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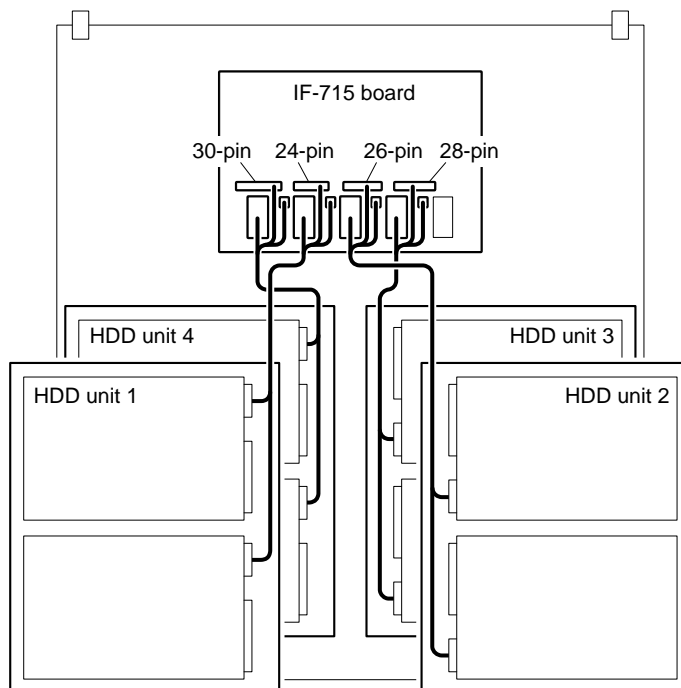
#### HDD unit

BKNW-116 has four HDD units. These units have the same configuration except bundling of the harness.

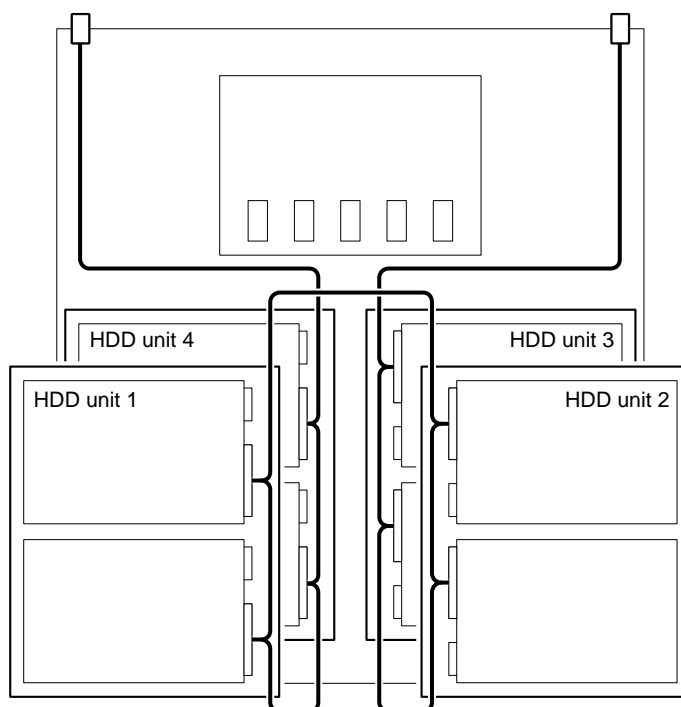
#### Notes on removal/installation

- HDD unit is connected to IF-715 board with harnesses. Avoid making incorrect connection of harness referring to “Connection 1” on the next page.
- Hard disk drives in HDD unit are connected with SCSI cable. After removal of several HDD units, connect them properly referring to “Connection 2” on the next page.

## &lt; Connection 1 &gt; Connection between HDD units and IF-715 board



## &lt; Connection 2 &gt; Connection of SCSI cable to HDD units



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## Outline

1. Removal of upper lid
2. Removal of bracket
3. Removal of HDD unit
4. Replacement of hard disk drive
5. Installation of HDD unit
6. Attachment of bracket
7. Attachment of upper lid

---

## Tools

- Torque screwdriver's bit (+3mm, l = 90mm): J-6323-430-A
- HDD cushion: J-6530-060-A
- Shockless torque screwdriver 1.2 N•m {12kgf•cm}: J-6530-070-A

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## Preparation

1. Turn off the power and wait for more than 30 seconds.

### CAUTION

Turn off the power and wait till a heat up device cools when replacing HDDs or its peripheral parts.

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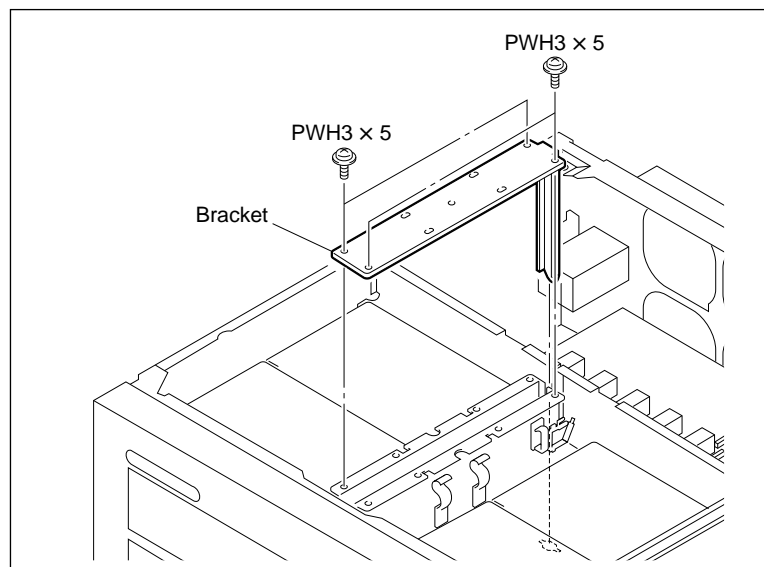
## Removal

### 1. Removal of upper lid

Refer to Section 1-6.

### 2. Removal of bracket

- (1) Unscrew the four screws and remove the bracket.





### 3. Removal of HDD unit

Removal method varies according to the HDD unit.

#### For upper part (HDD unit 1 or 2) ;

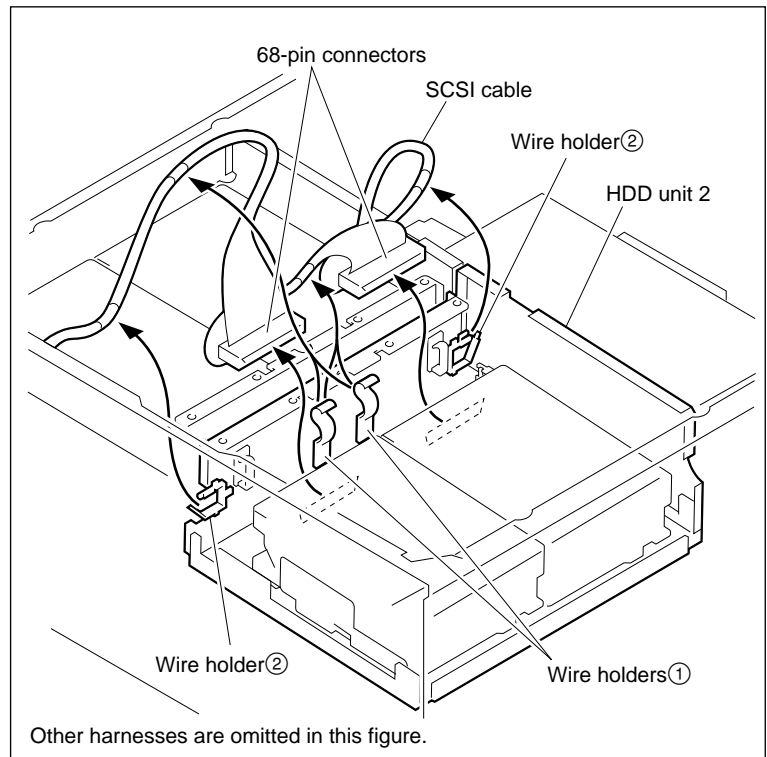
(The figure shows the removal of HDD unit 2.)

- (1) Remove the SCSI cable from wire holders ①.
- (2) Disconnect the two 68-pin connectors by holding each end of it.

**Note**

Never pull the covered wire.

- (3) Open wire holder ② and free the SCSI cable.

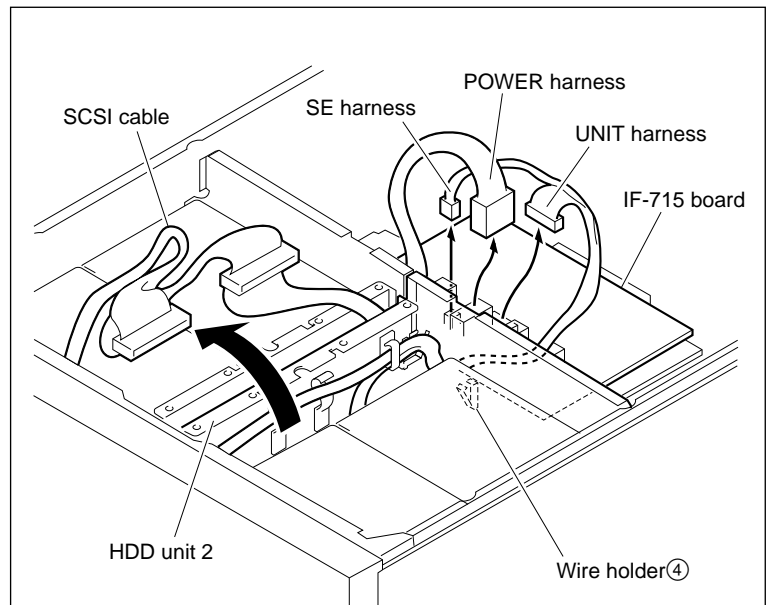


- (4) Move the SCSI cable to the opposite side of the HDD unit 2 as shown in the figure.

**Note**

Place the SCSI cable gently so that the hard disk drives do not receive any shock.

- (5) Disconnect the three harnesses shown in the figure from the IF-715 board.
- (6) Free SE harness and UNIT harness from wire holder ④.



- (7) Unscrew the six screws.

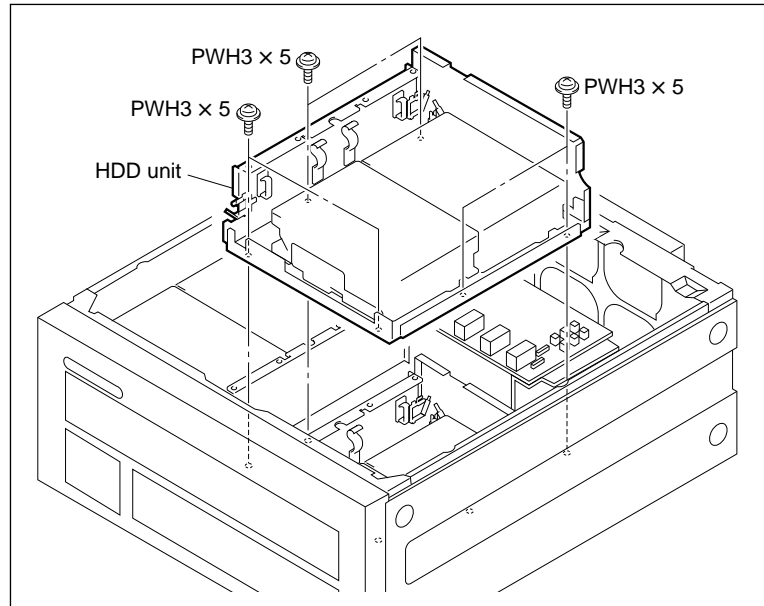
**Note**

Never hit the hard disk drive with a screw driver.

- (8) Lift up the HDD unit and remove it.

**Note**

Place removed the HDD unit gently on the HDD cushion.



**For lower part (HDD unit 3 or 4);**

**Note**

First of all, remove the upper HDD unit on HDD unit to be removed.

(The figure shows the removal of HDD unit 3.)

- (1) Remove the SCSI cable from wire holders ①.
- (2) Disconnect the two 68-pin connectors by holding each end of it.

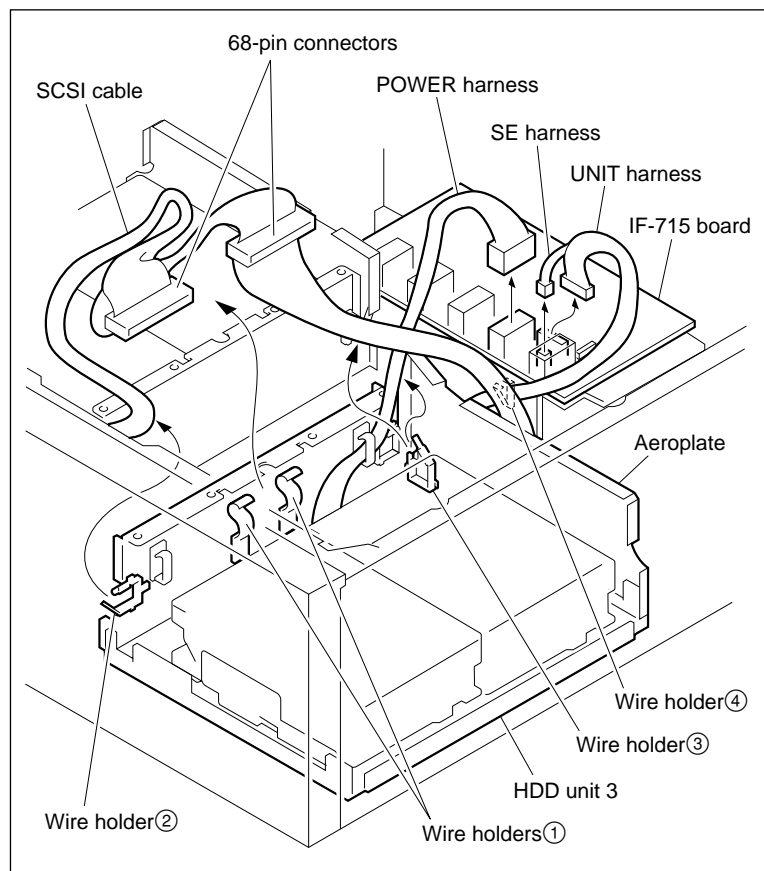
**Note**

Never pull the covered wire.

- (3) Open wire holder ② and free the SCSI cable.
- (4) Open wire holder ③ and free the SCSI cable and POWER harness.
- (5) Free the cable and harness described in (4) as shown in the figure with bending the aeroplate lightly.
- (6) Move the SCSI cable to the opposite side of the HDD unit 3 as shown in the figure with bending the aeroplate lightly.

**Note**

Place the SCSI cable gently so that the hard disk drives do not receive any shock.



- (7) Remove the HDD unit by the same way as (5) to (8) of upper HDD unit removal.

#### 4. Replacement of hard disk drive

Refer to Section 2-2-3.

## Installation

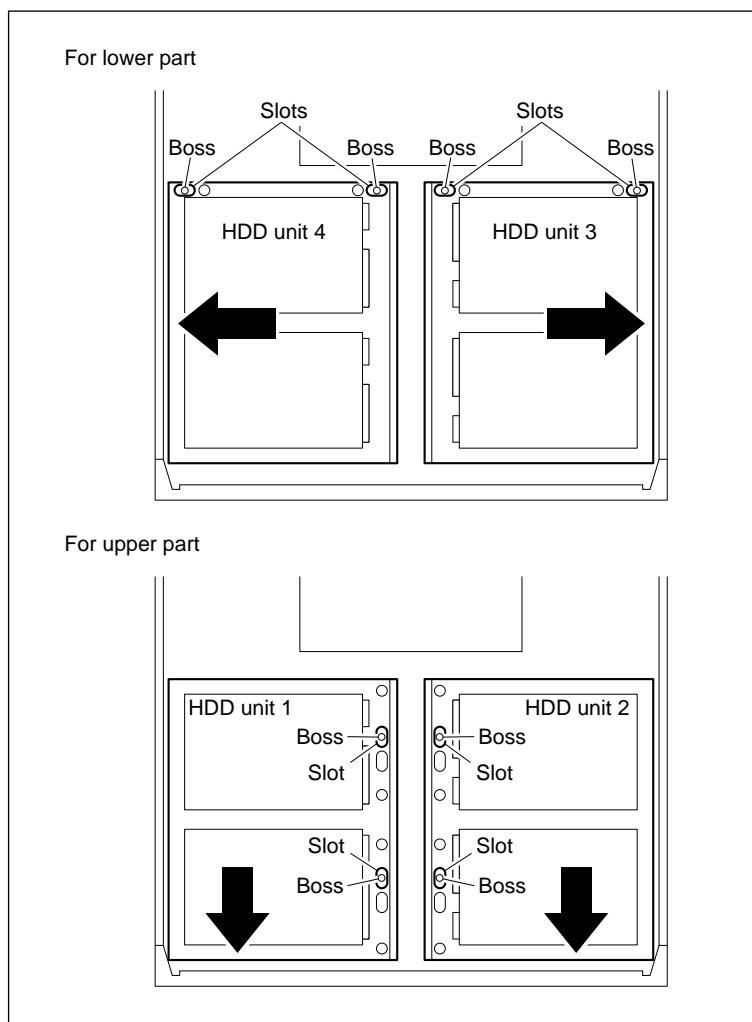
### 5. Installation of HDD unit

It is required to install the lower part (HDD unit 3 or 4) first before installing the upper part (HDD unit 1 or 2).

- (1) Place HDD unit inside the chassis.

#### Note

Align the slots of HDD unit with the bosses, then adjust the location of HDD unit by pushing it in the direction shown by the arrow in the figure.

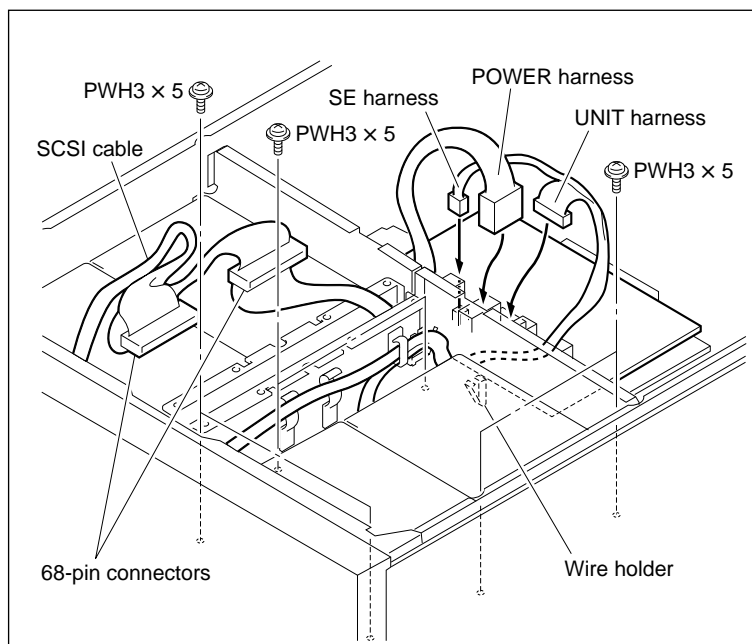


- (2) Fix the HDD unit with the six screws.
- (3) Connect the three harnesses to the connectors on the IF-715 board.

#### Note

Connector to connect the harness from each HDD unit is specified. Refer to "Connection 1" on page 2-3 (E) and connect them properly.

- (4) Bundle the SE harness and UNIT harness with a wire holder.
- (5) Connect the two 68-pin connectors to the HDD unit.



- (6) Bundle the SCSI cable and harness with wire holders.

**Note**

Bundling method varies according to each HDD unit. Refer to the figure and gather properly.

## 6. Attachment of bracket

- (1) Fix the bracket with the four screws.

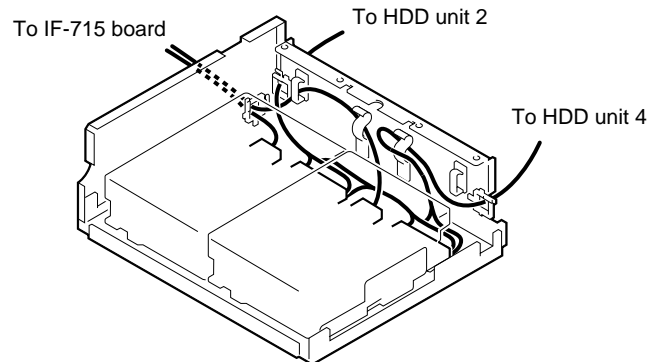
**Note**

Insert the bracket in the hole of the chassis and fix it.

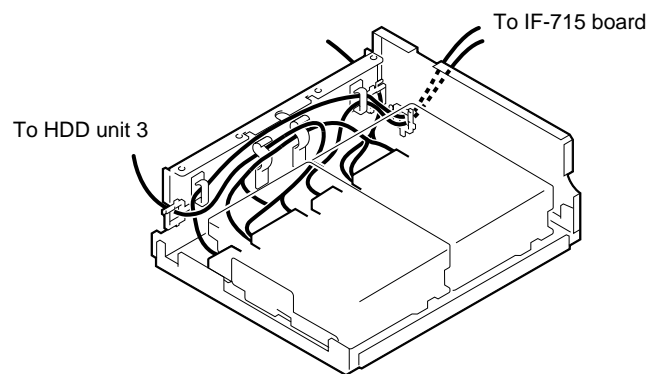
## 7. Attachment of upper lid

Refer to Section 1-6.

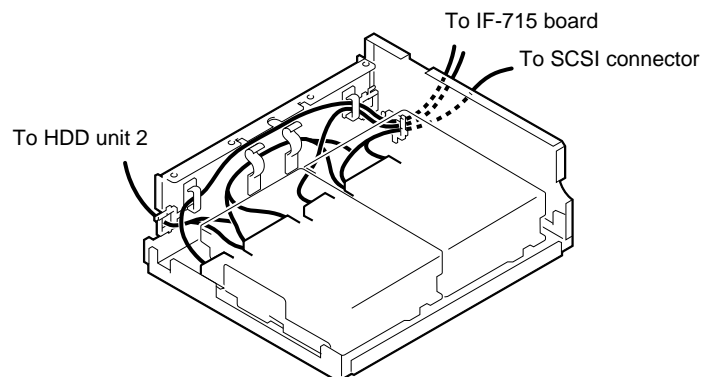
HDD unit 1



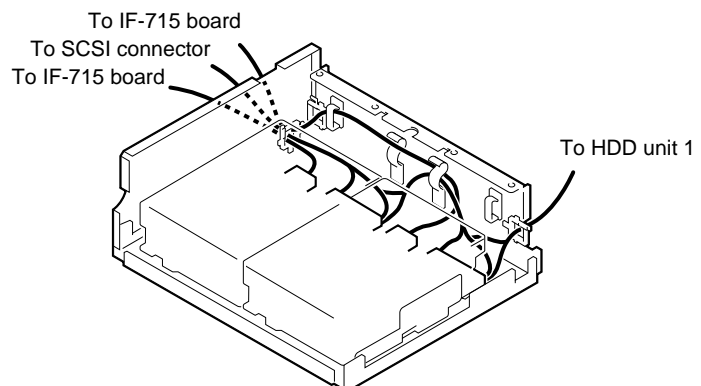
HDD unit 2



HDD unit 3



HDD unit 4



## 2-2-3. Removal/Installation of Hard Disk Drive

---

### Outline

1. Removal of HDD unit
2. Removal of hard disk drive
3. Removal of CN-1667/1668 boards
4. Attachment of CN-1667/1668 boards
5. Attachment of hard disk drive
6. Installation of HDD unit

---

### Tools

- Torque driver's bit (+3mm, l = 90mm): J-6323-430-A
- HDD cushion: J-6530-060-A
- Shockless torque screwdriver 1.2 N•m {12kgf•cm}: J-6530-070-A

---

### Notes

- Carry out the all work mentioned in this section on HDD cushion.
- Carry out the all work mentioned in this section using shockless torque screwdriver. Never use the former ratchet type torque driver.

---

### Preparation

1. Turn off the power and wait for more than 30 seconds.

---

### Removal

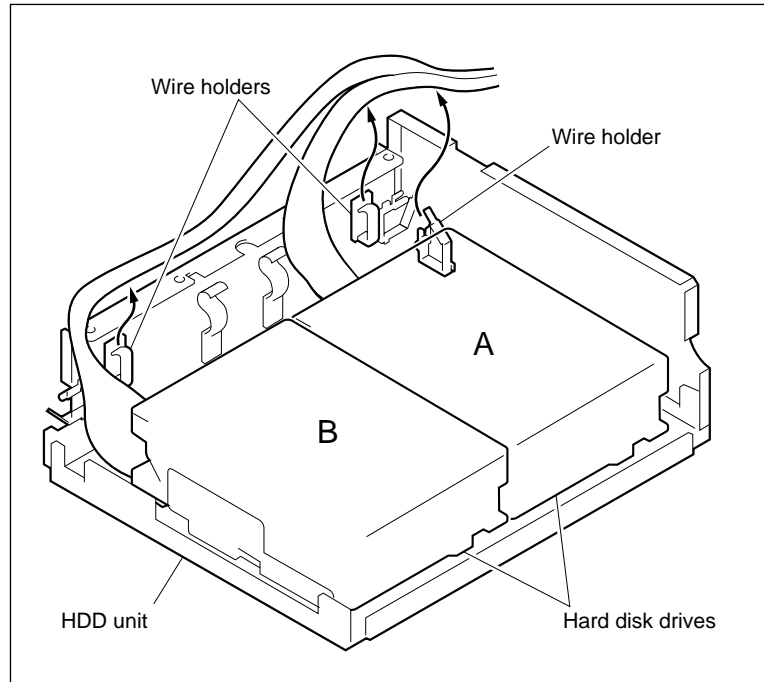
#### 1. Removal of HDD unit

Refer to procedure 1 to 3 in Section 2-2-2.

## 2. Removal of hard disk drive

In this procedure, explanation is made assuming that there are hard disk drives A and B in HDD unit and A is to be removed.

- (1) Open the wire holders of HDD unit and free the harnesses.

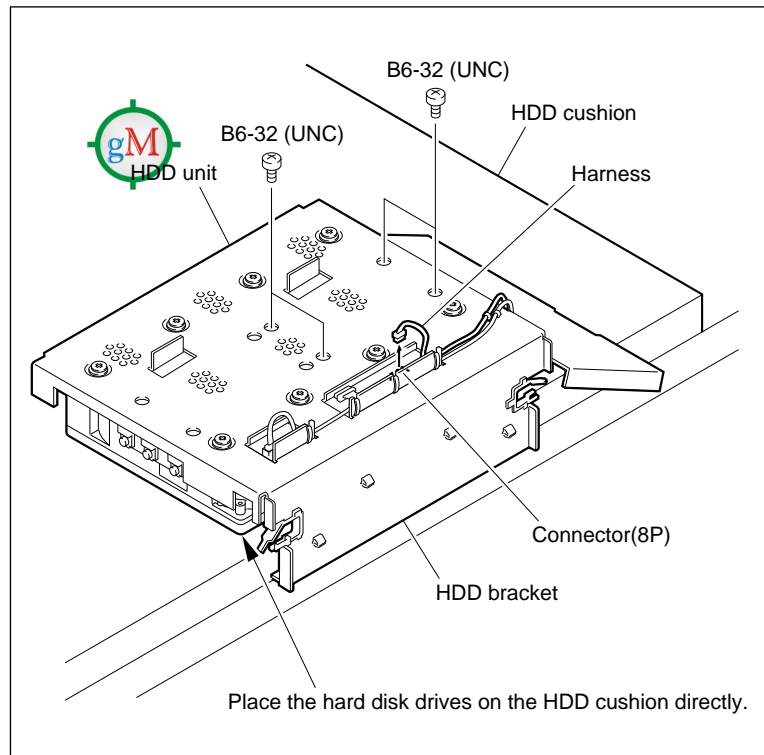


- (2) Place the HDD cushion at the edge of desk as shown in the figure.
- (3) Turn the HDD unit upside down and place it gently as shown in the figure.

### Note

Put the edge of the HDD bracket to outside of desk so that the hard disk drives can be placed on the HDD cushion directly.

- (4) Disconnect the harness from the connector (8P) of the hard disk drive to be removed.
- (5) Unscrew the four unify screws.

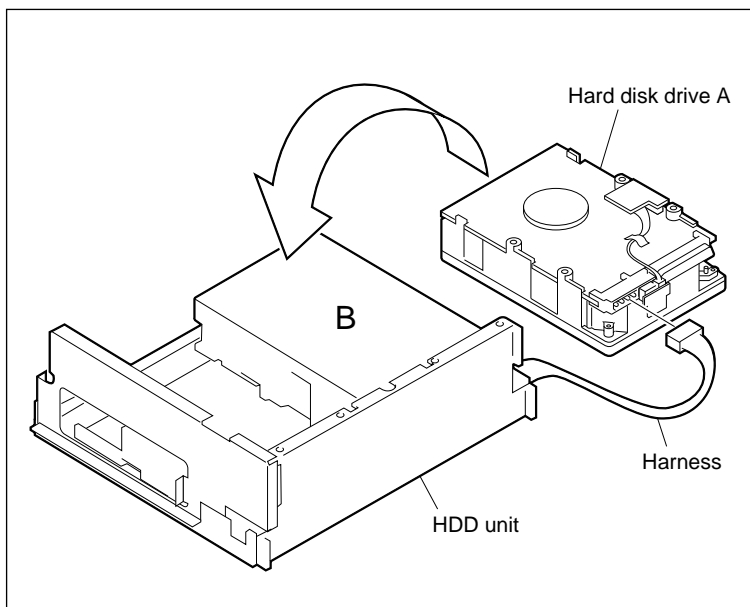


- (6) Lift up the HDD unit and place it aside facing upwards.

**Note**

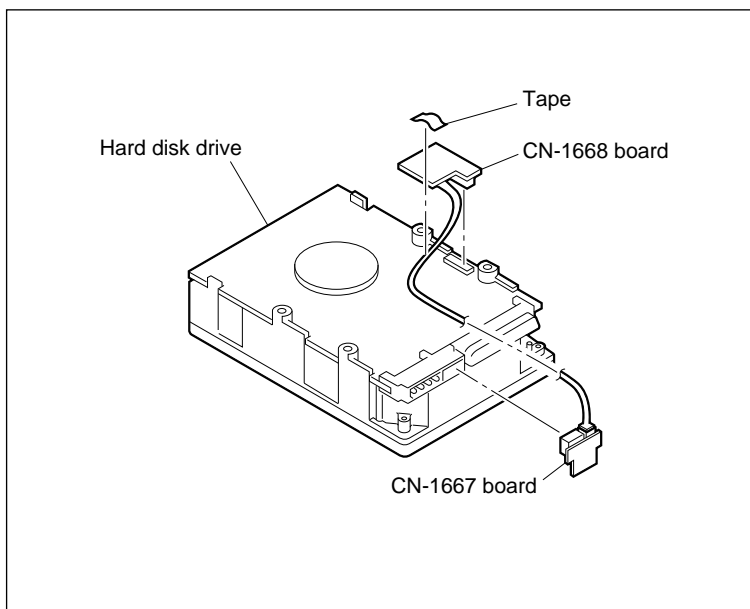
Never knock the hard disk drive with the HDD unit.

- (7) Disconnect the harness from the connector of the removed hard disk drive.



### 3. Removal of CN-1667/1668 boards

- (1) Peel off the tape.
- (2) Remove the CN-1667/1668 boards from the hard disk drive.



## Installation

### Note

Pay special attention to the work mentioned in the following so that no shock is applied to hard disk drive.

#### 4. Attachment of CN-1667/1668 boards

- (1) Connect the CN-1667/1668 boards to the hard disk drive.

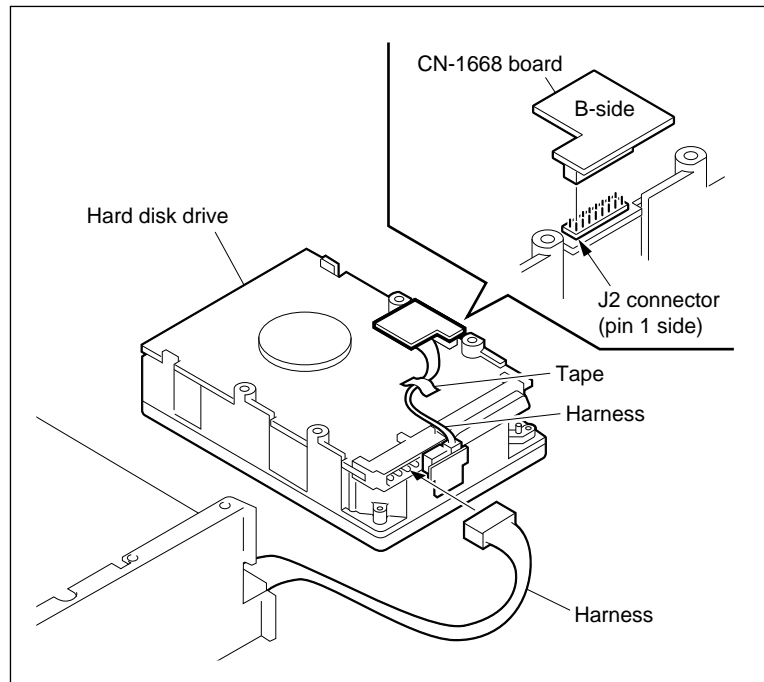
### Note

Align to pin 1 side of each connector when connecting the CN-1668 board.

- (2) Fix the harness with tape.

### Note

When the new tape is used, cut the Scotch electrical tape, flame-resistant film No.10 (or equivalent) in 2.5 cm, and use it.



#### 5. Attachment of hard disk drive

- (1) Connect the harness to the connector of hard disk drive.
- (2) Place the HDD unit gently on the hard disk drive and match the location of screw holes.

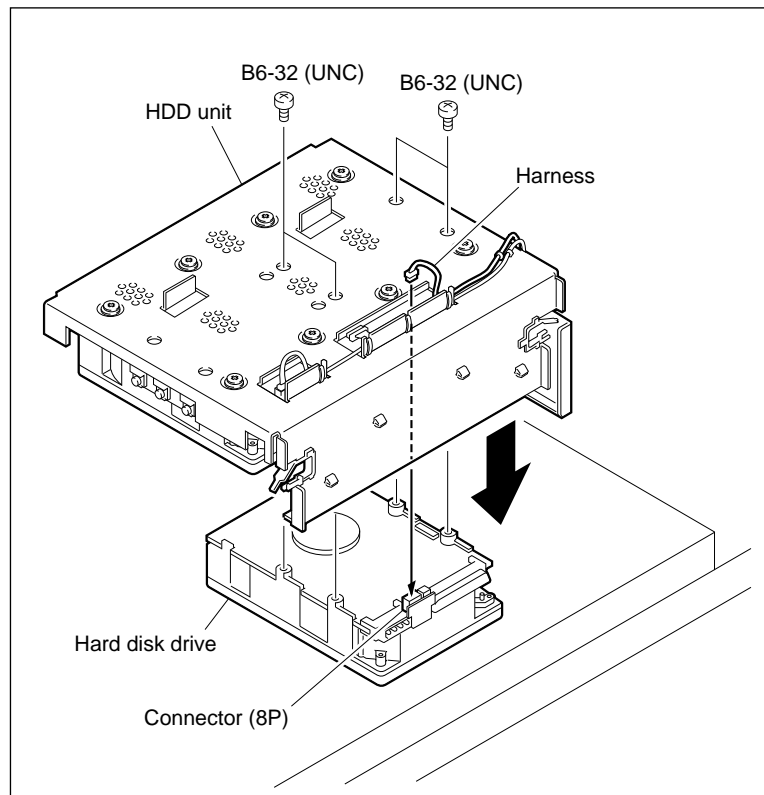
### Note

Carry out this work carefully so that the HDD unit doesn't hit the hard disk drive.

- (3) Fix the hard disk drive to HDD unit with the four unify screws.

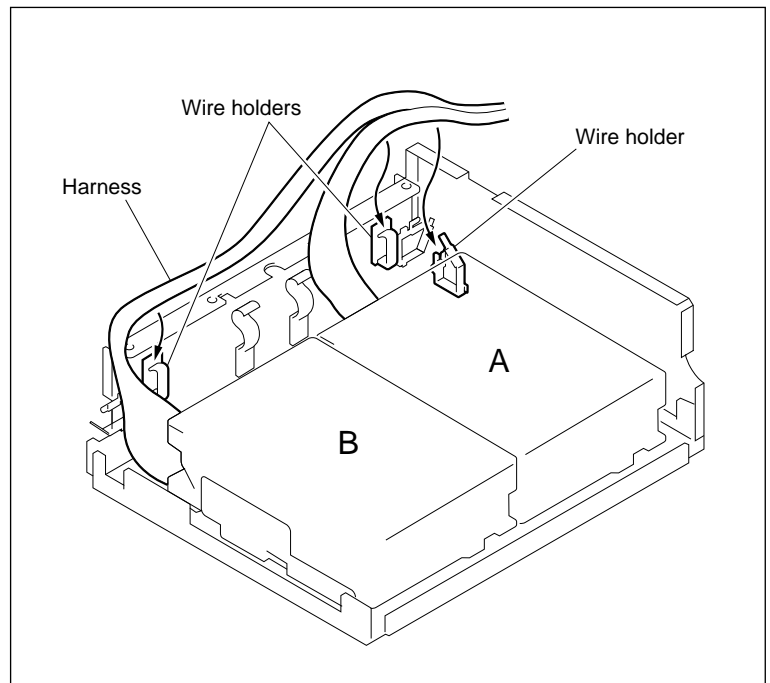
Tightening torque:  $98 \times 10^{-2} \text{ N}\cdot\text{m}$   
 $\{10\text{kgf}\cdot\text{cm}\}$

- (4) Connect the harness to the connector on the hard disk drive (8P).





- (5) Place the HDD unit gently on the HDD cushion with the hard disk drive attached upside down.
- (6) Bundle the harnesses with the wire holders.



## 6. Installation of HDD unit

Refer to procedure 5 of Section 2-2-2.

## 2-3. Replacement of Power Supply Unit

### Note

The replacement method of power supply unit differs according to a number of power-cooling-fan.

### 2-3-1. In the Case of Two Power-Cooling-Fan

---

#### Outline

1. Removal of upper lid
2. Removal of fan bracket
3. Removal of harness
4. Removal of SW cover
5. Removal of power supply unit
6. Installation of power supply unit/SW cover
7. Connection of harness
8. Attachment of fan bracket
9. Attachment of upper lid

---

#### Preparation

1. Turn off the power and wait for more than 30 seconds.
2. Pull out the power cord from AC outlet.

### CAUTION

Turn off the power and wait till a heat up device cools when replacing HDDs or its peripheral parts.

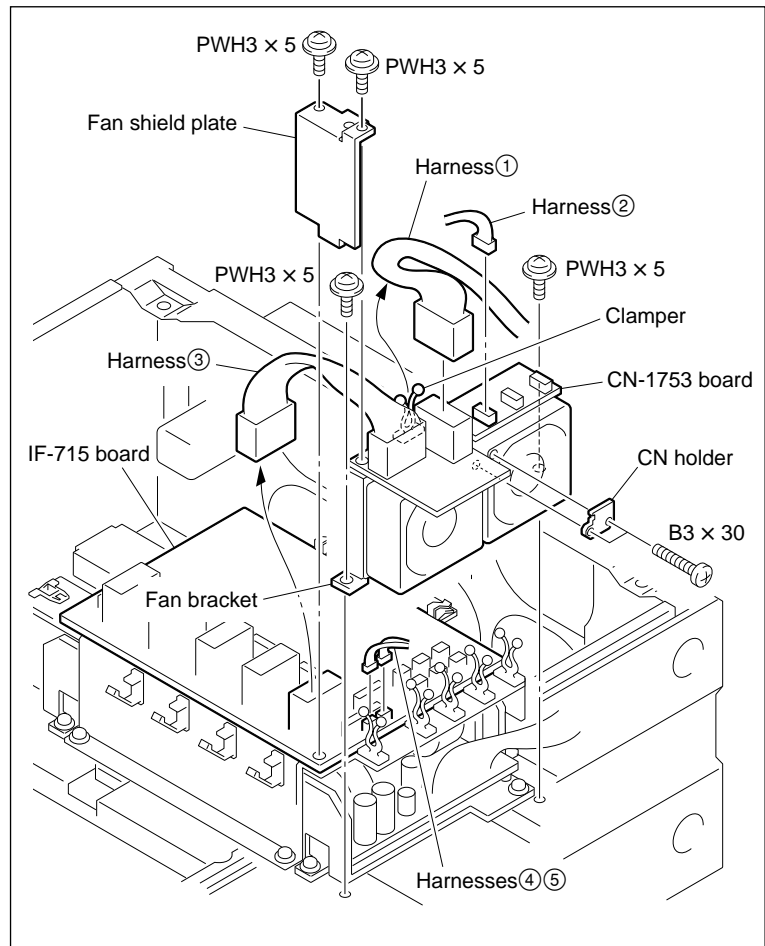
## Removal

### 1. Removal of upper lid

Refer to Section 1-6.

### 2. Removal of fan bracket

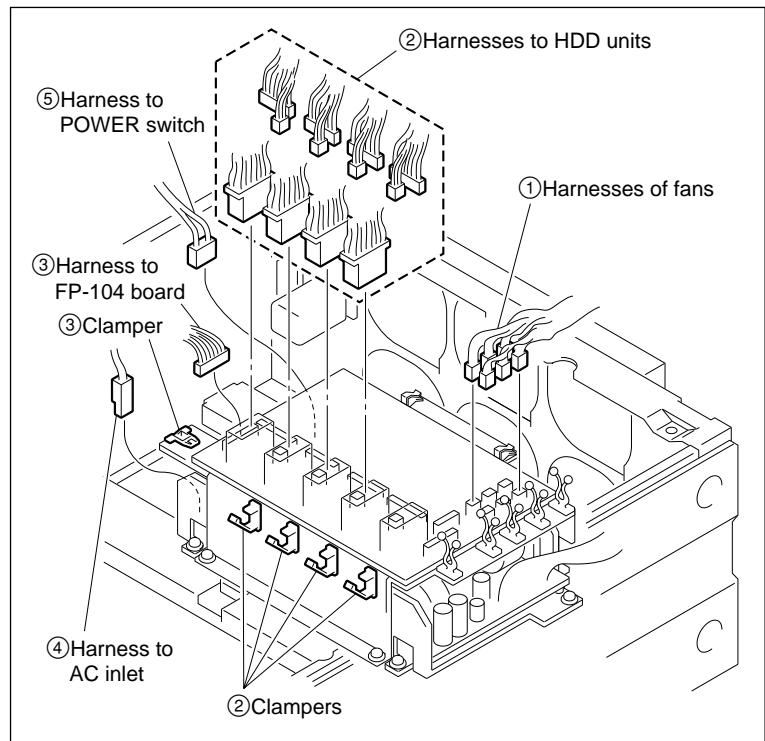
- (1) Free the harness ① from the clamber on the fan bracket.
- (2) Disconnect the harnesses ① and ② from the CN-1753 board.
- (3) When the board No. suffix of the IF-715 board is -11, disconnect the harness ② from the CN-1753 board.
- (4) When the board No. suffix of the IF-715 board is -12 and higher, disconnect the harnesses ④ and ⑤ from the IF-715 board.
- (5) Disconnect the harness ③ from the IF-715 board.
- (6) Unscrew the two screws (PWH 3 × 5) and remove the fan shield plate.
- (7) Unscrew the two screws (PWH 3 × 5) and remove the fan bracket.
- (8) Unscrew the two screws (B 3 × 30) and remove the CN holder.



### 3. Removal of harness

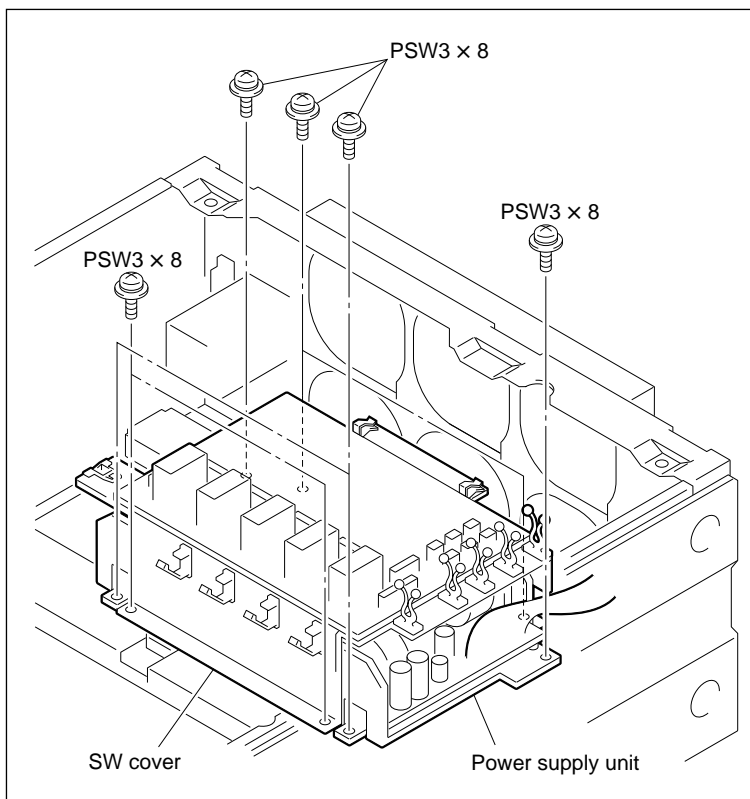
Remove all harnesses which are connected to the power supply unit and the IF-715 board.

- ① Free the six harnesses of fans 1 to 6 from clammers and remove them.
- ② Disconnect the 12 harnesses which are connected to the HDD units. Free these harnesses from clammers.
- ③ Free the harness which is connected to FP-104 board from clamber and disconnect this harness.
- ④ Disconnect the harness which is connected to AC inlet.
- ⑤ Disconnect the harness which is connected to the POWER switch.



#### 4. Removal of SW cover

- (1) Unscrew the four screws which are fixing the SW cover.
- (2) Unscrew the four screws which are fixing the power supply unit.



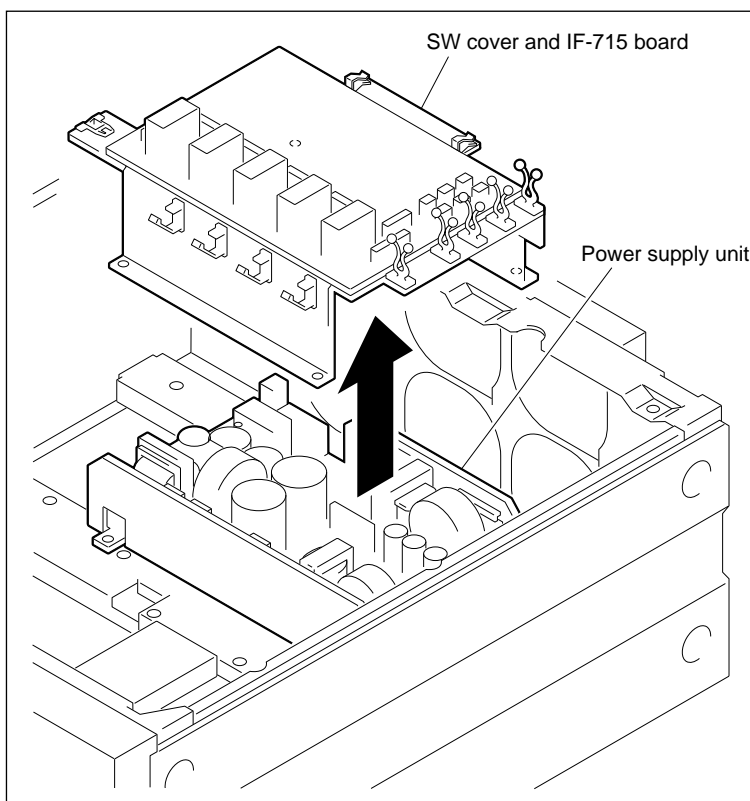
- (3) Move the SW cover with the power supply unit.
- (4) Remove the SW cover with the IF-715 board.

**Note**

Pay attention to avoid catching on the harness.

**Note**

Do not remove the ventilation sheet affixed to the back of the SW cover.

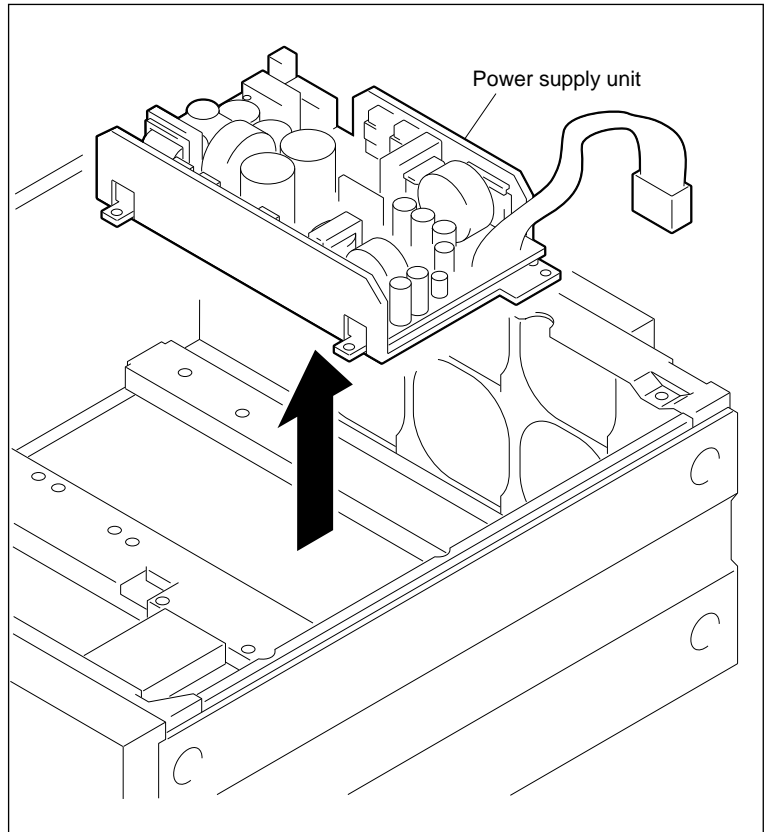


## 5. Removal of power supply unit

- (1) Lift up the power supply unit and remove it.

**Note**

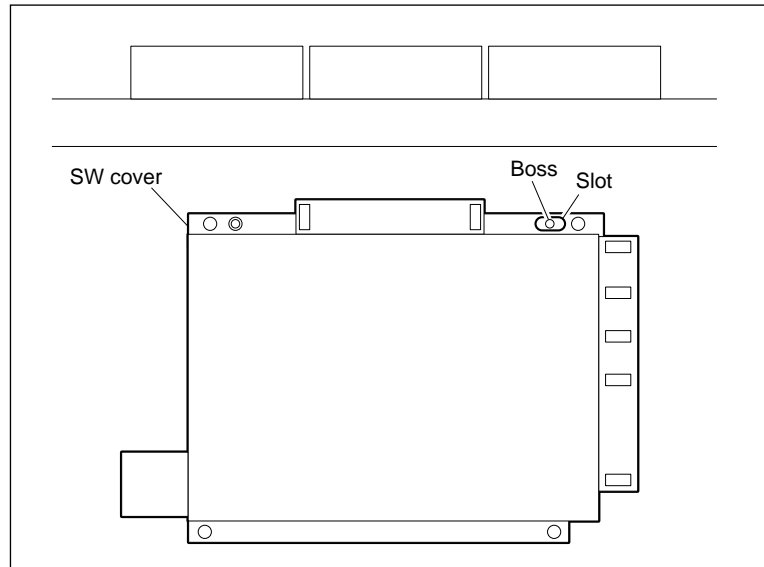
Pay attention to avoid catching on the harness.



## Installation

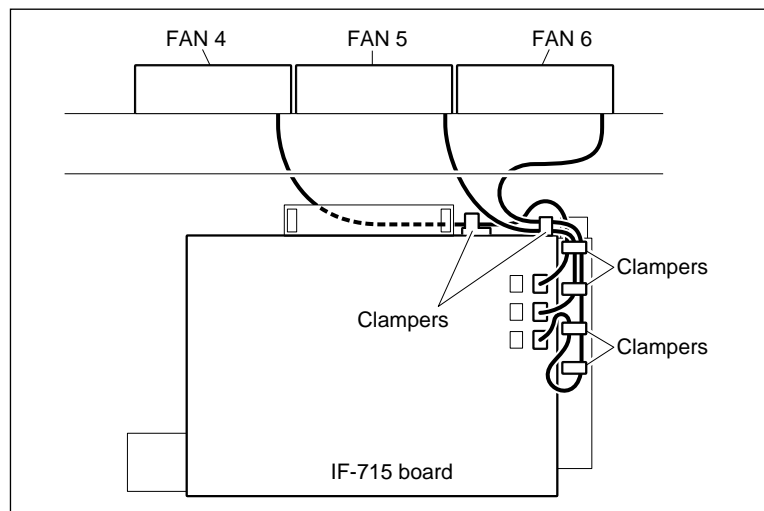
### 6. Installation of power supply unit/SW cover

- (1) Place the power supply unit in the chassis with paying attention to avoid catching on the harness.
- (2) Place the SW cover on the power supply unit with paying attention to avoid catching on the harness.
- (3) Adjust the location of screw holes and fix the power supply unit with the four screws.
- (4) Adjust the location of the SW cover by aligning the slot of SW cover with the boss, then fix the switch cover with the four screws.

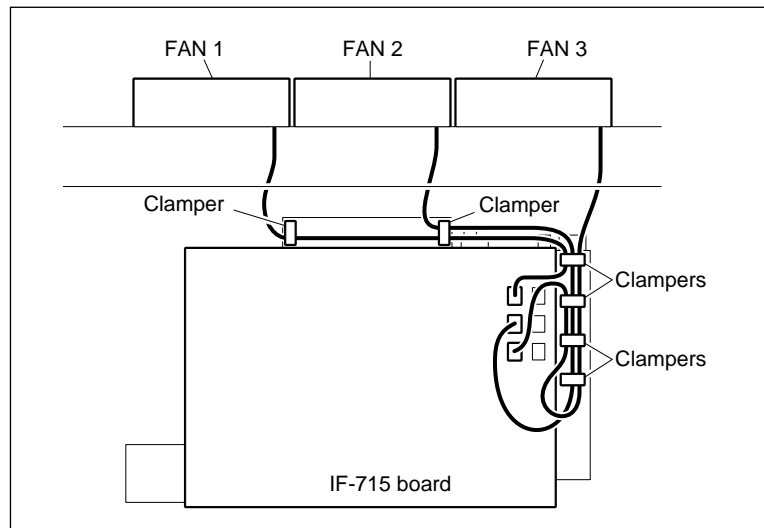


### 7. Connection of harness

- (1) Connect the harnesses in the reverse order referring to “3. Removal of harness”. However, refer to the following figure for bundling the harnesses of fans 1 to 6.
- Connect the harnesses of fans 4, 5 and 6, then bundle them with clampers.

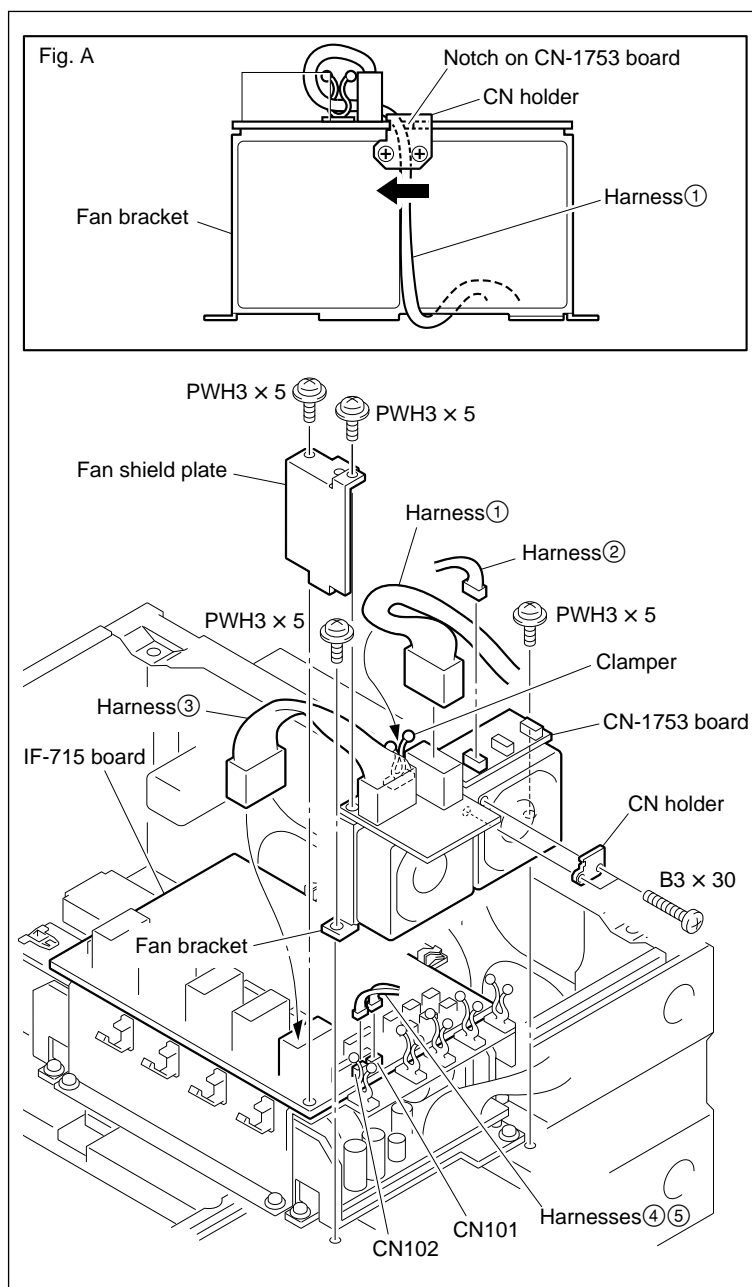


- Connect the harnesses of fans 1, 2 and 3, then bundle them with clampers.



## 8. Attachment of fan bracket

- (1) Draw the harness ① between two fans as shown in Fig.A.
- (2) Put the harness ① in the notch of the CN-1753 board, then fix the CN holder with two screws (B3 × 30).
- (3) Fix the fan bracket with the two screws (PWH3 × 5) while holding the harness ① with the fan bracket as shown in Fig.A.
- (4) When the board No. suffix of the IF-715 board is -12 and higher, connect the harnesses ④ and ⑤ of power-cooling-fan to CN101 and CN102 on the IF-715 board.
- (5) Connect the harness ① to the CN-1753 board.
- (6) When the board No. suffix of the IF-715 board is -11, connect the harness ② to the CN-1753 board.
- (7) Bundle the harness ① in the clamp as shown in Fig.A.
- (8) Connect the harness ③ to the IF-715 board.
- (9) Fix the fan shield plate with two screws (PWH3 × 5).



## 9. Attachment of upper lid

Refer to Section 1-6.

## 2-3-2. In the Case of One Power-Cooling-Fan

---

### Outline

1. Removal of upper lid
  2. Removal of fan bracket
  3. Removal of harness
  4. Removal of SW cover
  5. Removal of power supply unit
  6. Installation of power supply unit/SW cover
  7. Connection of harness
  8. Attachment of fan bracket
  9. Attachment of upper lid
- 

### Preparation

1. Turn off the power and wait for more than 30 seconds.
2. Pull out the power cord from AC outlet.

#### **CAUTION**

Turn off the power and wait till a heat up device cools when replacing HDDs or its peripheral parts.





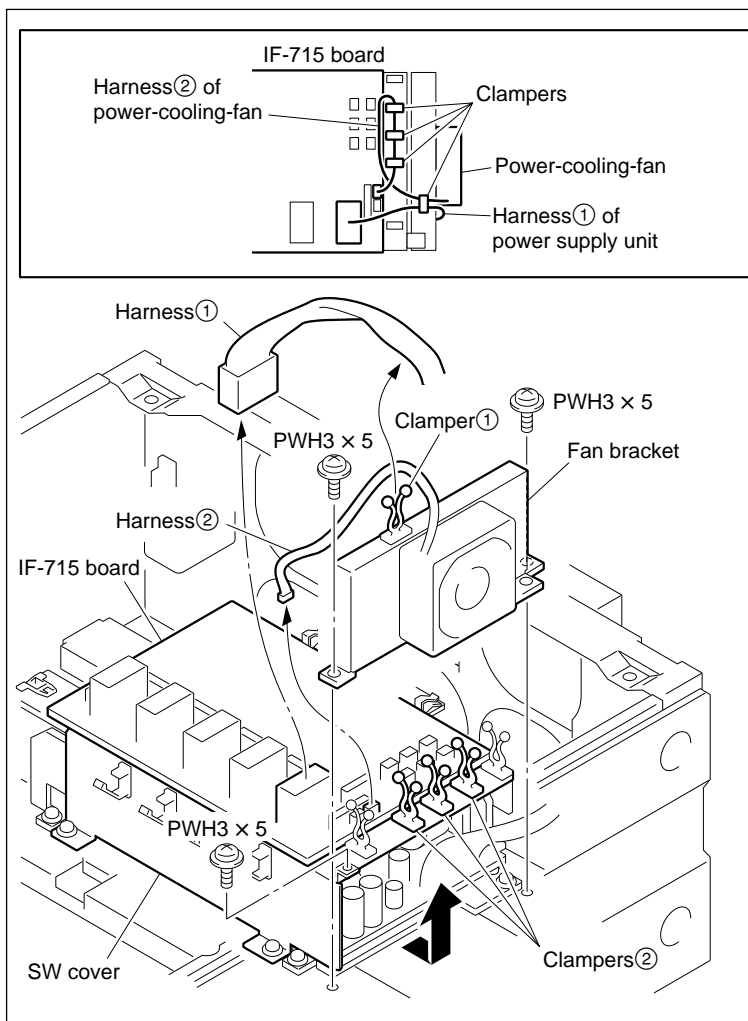
## Removal

### 1. Removal of upper lid

Refer to Section 1-6.

### 2. Removal of fan bracket

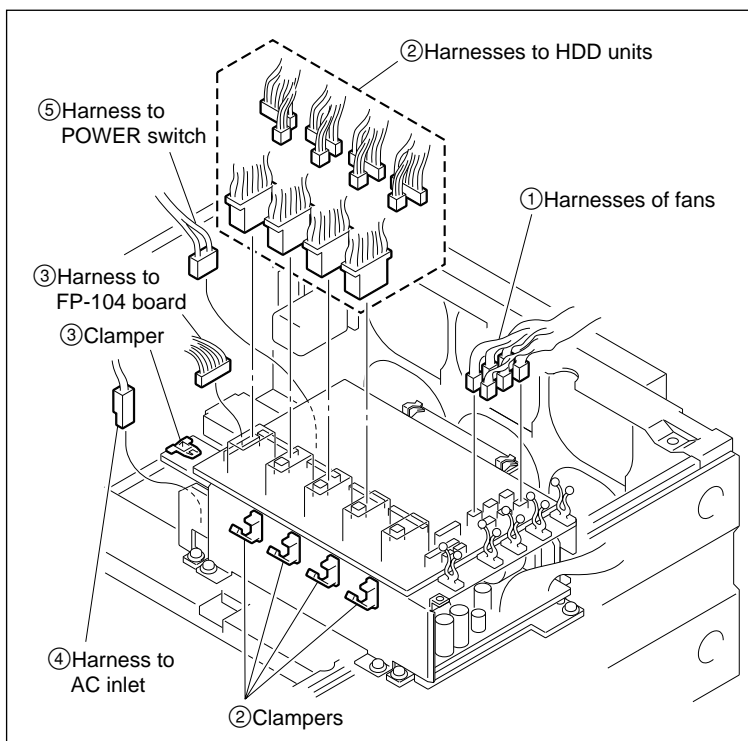
- (1) Free the harnesses ① and ② from the clamper ① on the fan bracket.
- (2) Free the harness ② from the clamper ② on the SW cover.
- (3) Disconnect the harnesses ① and ② from the IF-715 board.
- (4) Unscrew the three screws.
- (5) Remove the fan bracket in the direction of the arrow.



### 3. Removal of harness

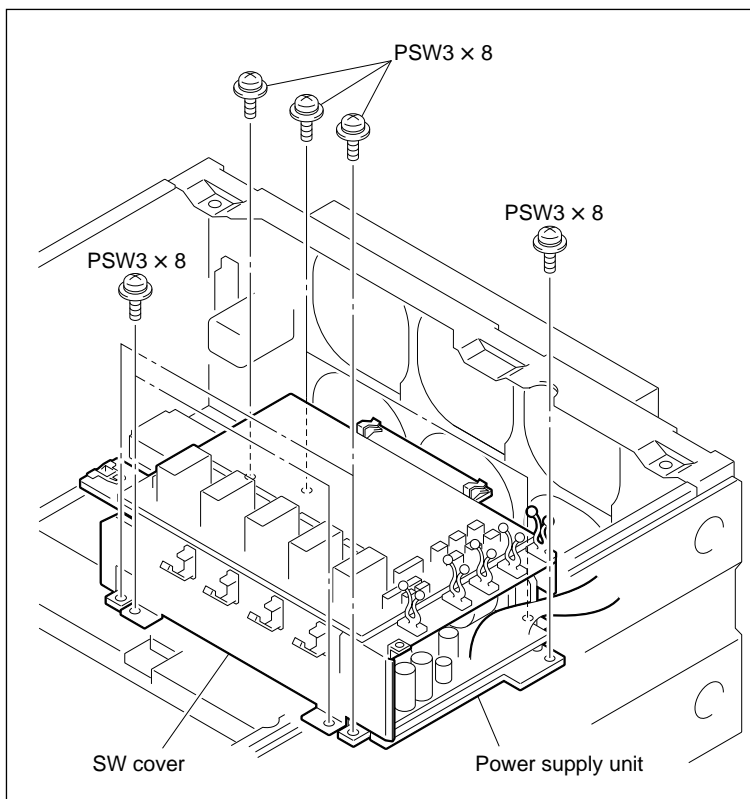
Remove all harnesses which are connected to the power supply unit and the IF-715 board.

- ① Free the six harnesses of fans 1 to 6 from clammers and remove them.
- ② Disconnect the 12 harnesses which are connected to the HDD units. Free these harnesses from clammers.
- ③ Free the harness which is connected to FP-104 board from clamper and disconnect this harness.
- ④ Disconnect the harness which is connected to AC inlet.
- ⑤ Disconnect the harness which is connected to the POWER switch.



#### 4. Removal of SW cover

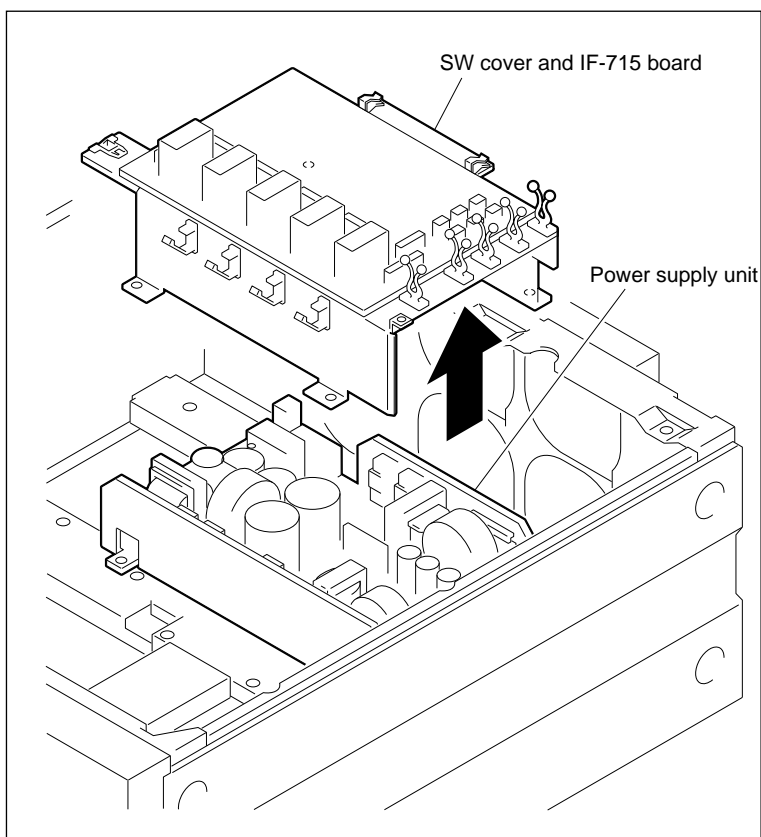
- (1) Unscrew the four screws which are fixing the SW cover.
- (2) Unscrew the four screws which are fixing the power supply unit.



- (3) Move the SW cover with the power supply unit.
- (4) Remove the SW cover with the IF-715 board.

**Note**

Pay attention to avoid catching on the harness.

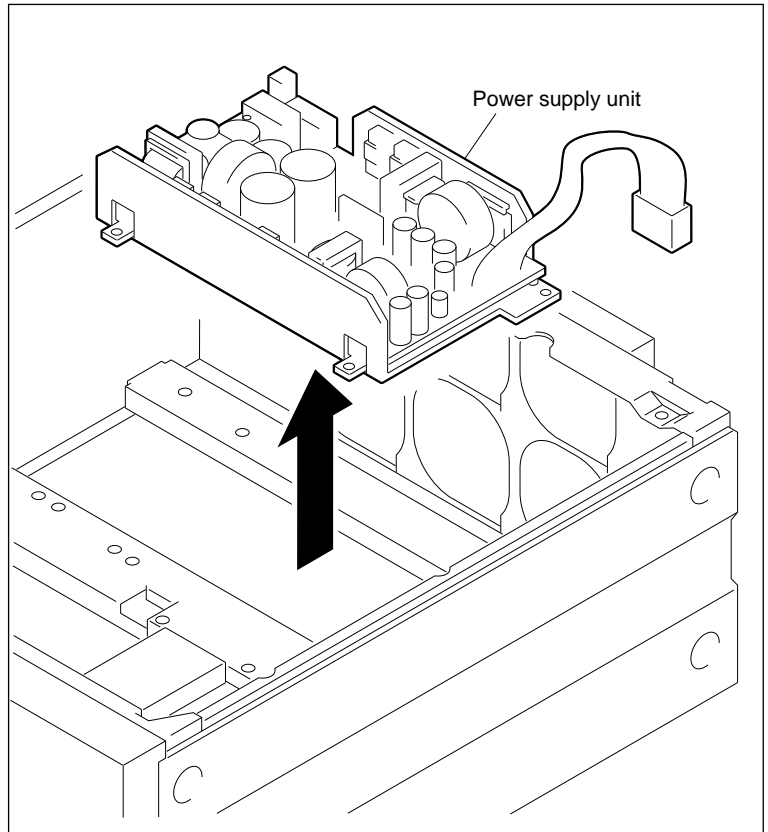


## 5. Removal of power supply unit

- (1) Lift up the power supply unit and remove it.

**Note**

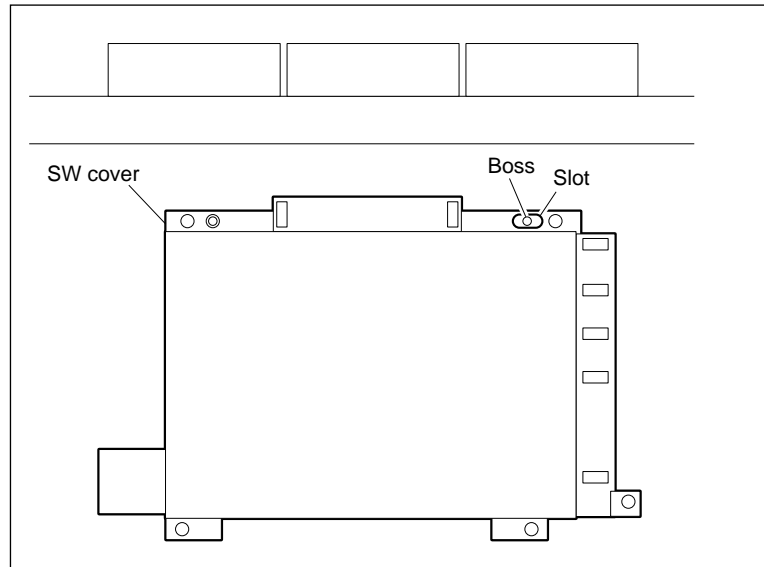
Pay attention to avoid catching on the harness.



## Installation

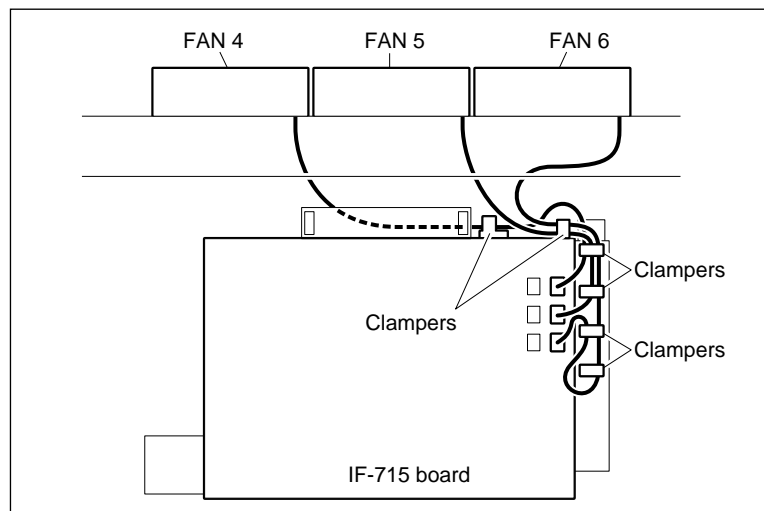
### 6. Installation of power supply unit/SW cover

- (1) Place the power supply unit in the chassis with paying attention to avoid catching on the harness.
- (2) Place the SW cover on the power supply unit with paying attention to avoid catching on the harness.
- (3) Adjust the location of screw holes and fix the power supply unit with the four screws.
- (4) Adjust the location of the SW cover by aligning the slot of SW cover with the boss, then fix the switch cover with the four screws.

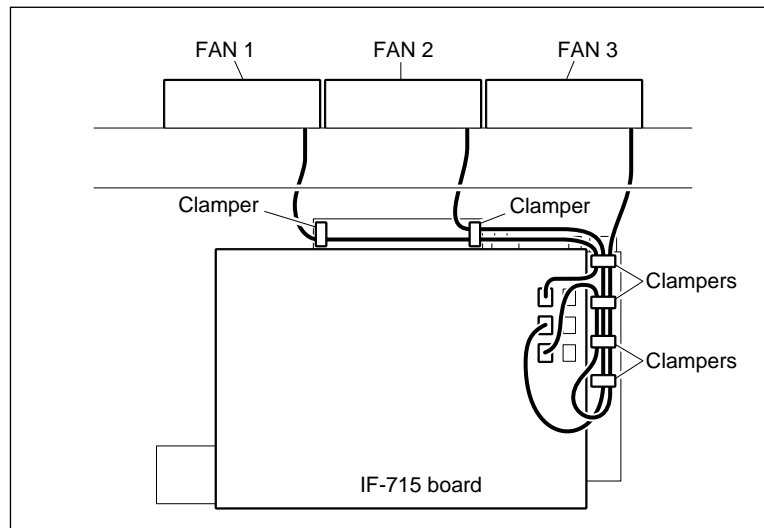


### 7. Connection of harness

- (1) Connect the harnesses in the reverse order referring to “3. Removal of harness”. However, refer to the following figure for bundling the harnesses of fans 1 to 6.
  - Connect the harnesses of fans 4, 5 and 6, then bundle them with clampers.

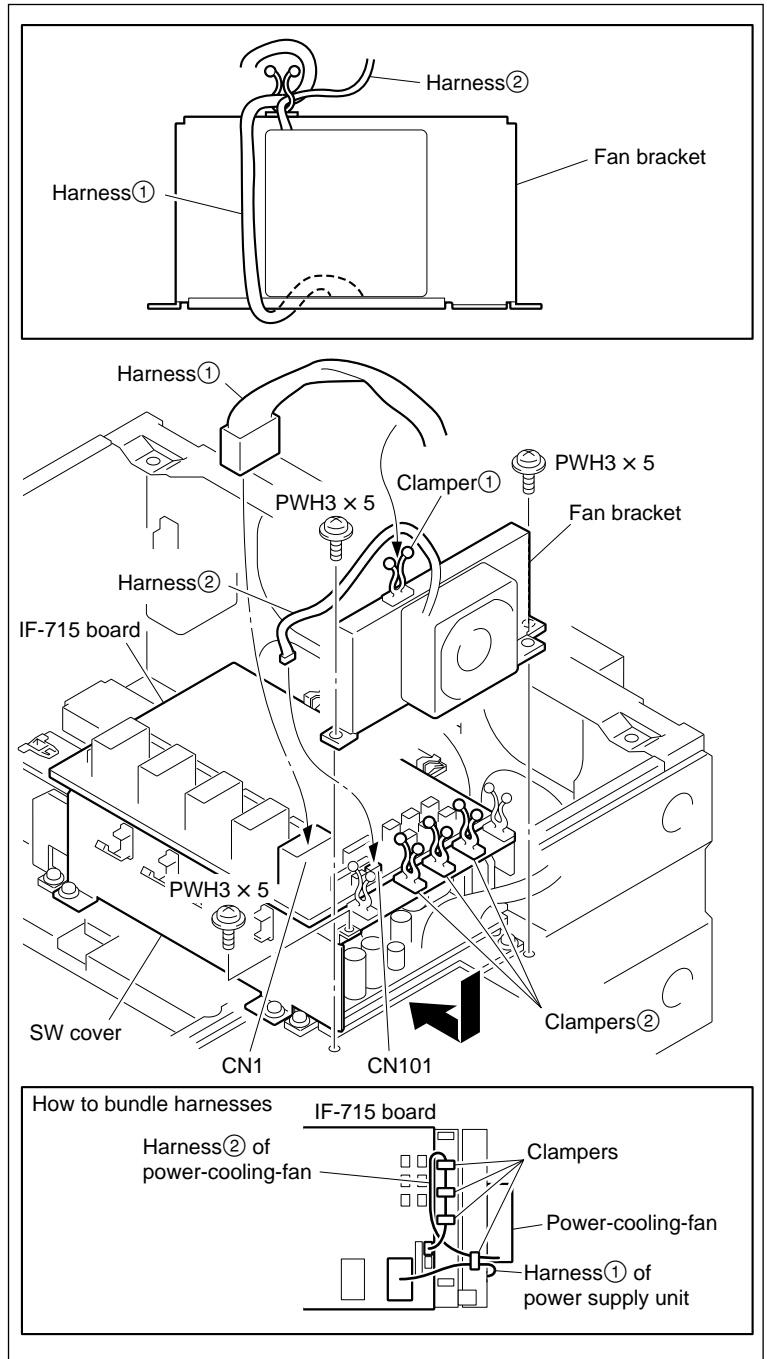


- Connect the harnesses of fans 1, 2 and 3, then bundle them with clampers.



## 8. Attachment of fan bracket

- (1) Put the fan bracket in the direction of the arrow, while holding the harness ① with fan bracket as shown in Fig A.
- (2) Fix the fan bracket with three screws.
- (3) Connect the harnesses ① to the CN1 and ② to the CN101 on the IF-715 board.



- (4) Bundle the harnesses ① and ② in the clammers ① and ② as shown in the figure.

## 9. Attachment of upper lid

Refer to Section 1-6.

## 2-4. Replacement of Board

This section explains the method of board replacement.  
It is not necessary to adjust after replacing the any board.

### CAUTION

Turn off the power and wait till a heat up device cools when replacing HDDs or its peripheral parts.

### 2-4-1. IF-715 Board

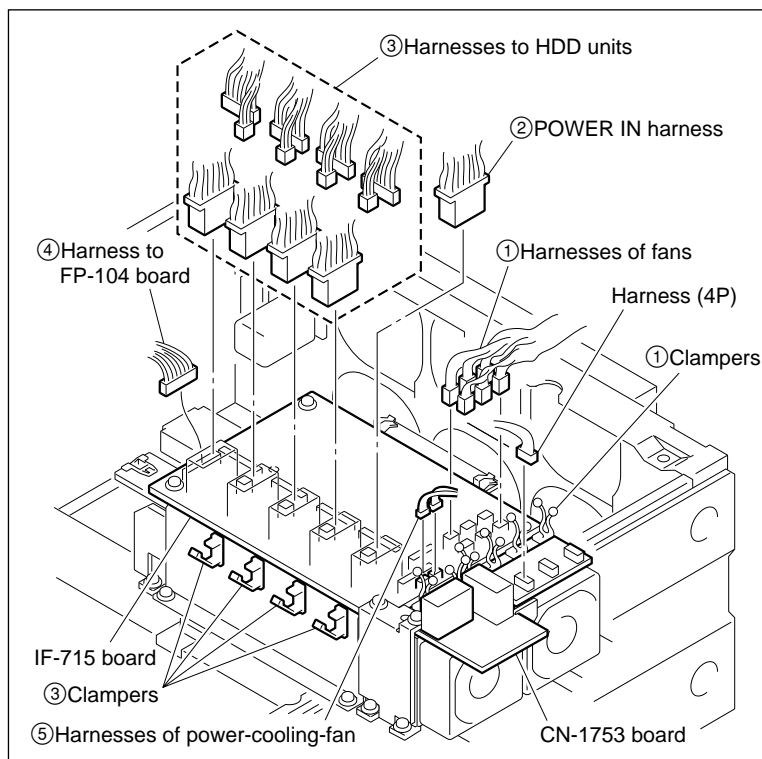
#### Note

The method of parts replacement differs according to a number of power-cooling-fan.

#### In the case of two power-cooling-fan

##### Removal

1. Turn off the power and wait for more than 30 seconds.
2. Remove the upper lid. (Refer to Section 1-6.)
3. Disconnect all harnesses on the IF-715 board.
  - ① Free the six harnesses of fans 1 to 6 from clampers and remove them.
  - ② Disconnect the POWER IN harness.
  - ③ Disconnect the 12 harnesses which are connected to the HDD units.  
Free these harnesses from clampers.
  - ④ Disconnect the harness which is connected to the FP-104 board.
  - ⑤ When the board No. suffix of the IF-715 board is -12 and higher, disconnect the two harnesses of power-cooling-fan.
4. When the board No. suffix of the IF-715 board is -11, disconnect the harness (4P) from the connector on the CN-1753 board.



5. Unscrew the two screws and remove the fan shield plate.
6. Unscrew the three screws.

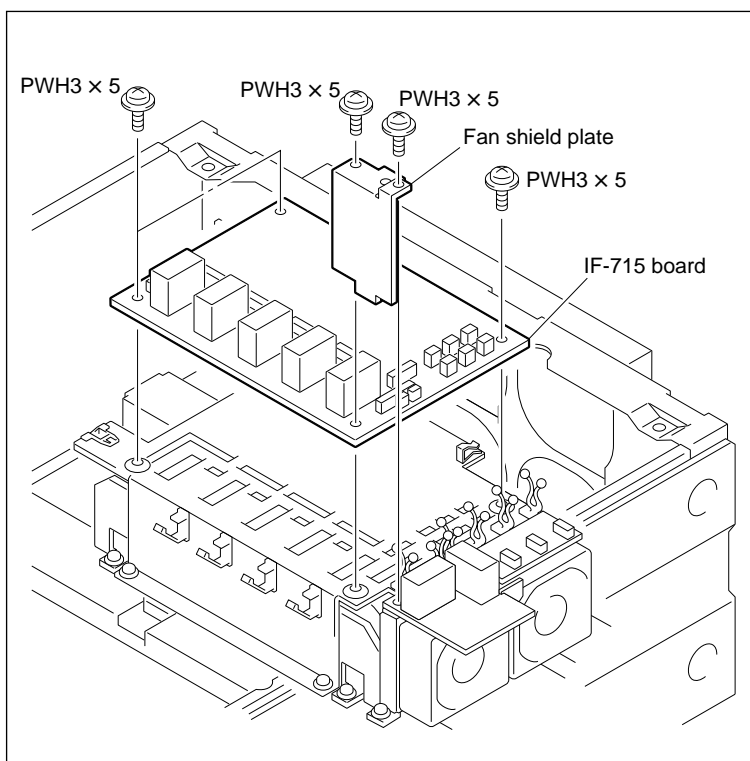
**Note**

Pay attention to avoid catching on the harness.

### Installation

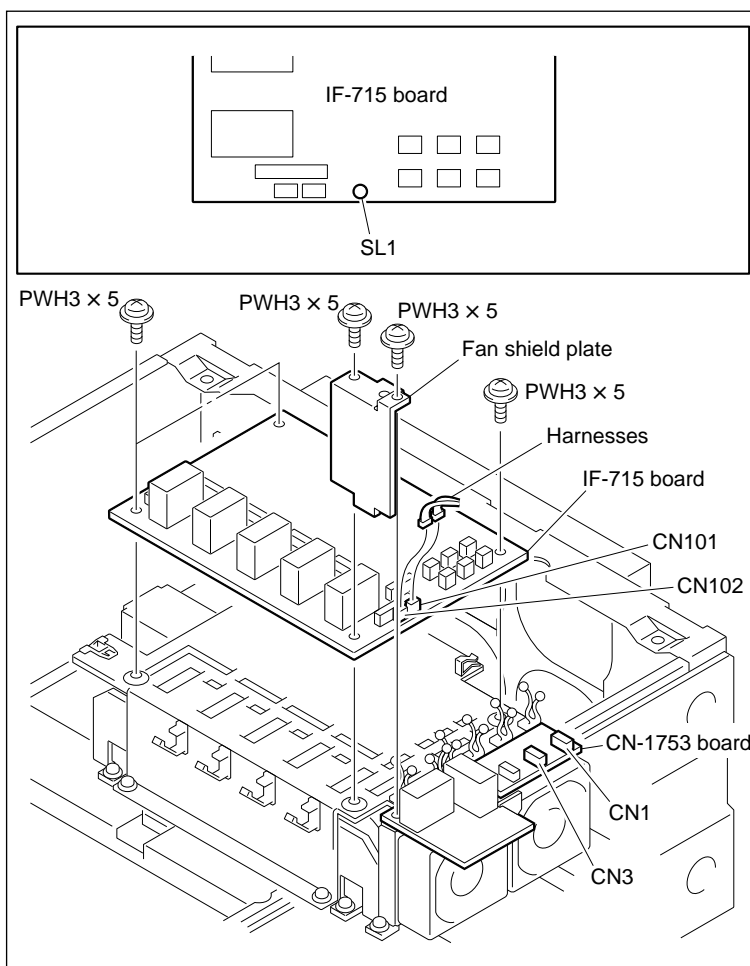
• **When installing the IF-715 board of suffix -11.**

Install in the reverse order of removal. However, for connection of harnesses of fans 1 to 6, refer to installation procedure 8 in “2-3. Replacement of Power Supply Unit” and connect it properly.



• **When installing the IF-715 board of suffix -12 and higher**

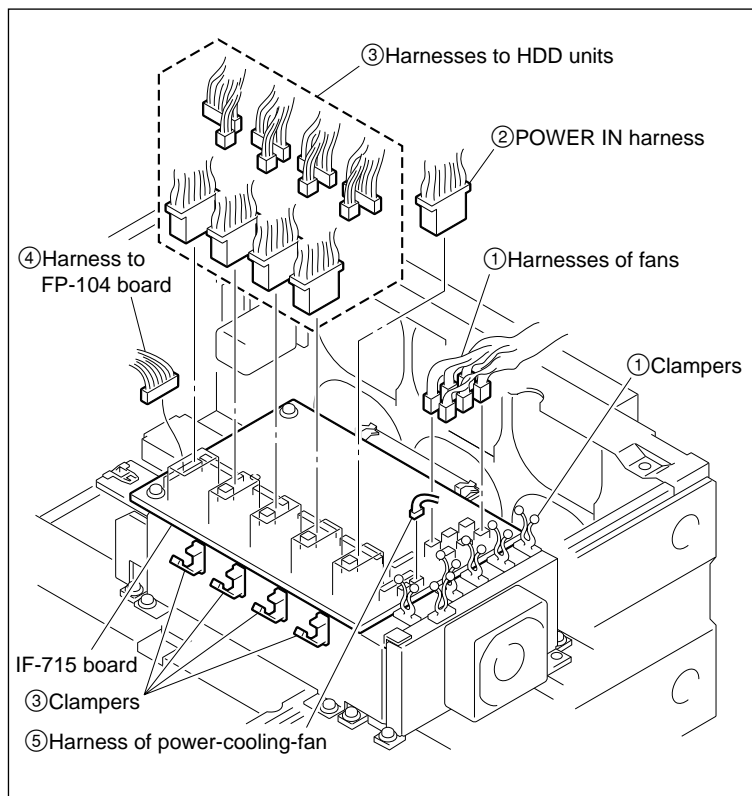
1. Short the shorting land SL1 on the IF-715 board (A side) with solder.
2. Place the IF-715 board on the SW cover with paying attention to avoid catching on the harness.
3. Fix the IF-715 board with three screws.
4. Attach the fan shield plate with two screws and fix the IF-715 board and fan bracket.
5. Connect the harnesses which were disconnected in removal step.  
However, for connecting the harnesses of fans 1 to 6, refer to installation procedure 8 in “2-3. Replacement of Power Supply Unit” and connect it properly.
6. Disconnect the harnesses from CN1 and CN3 on the CN-1753 board, connect them to CN101 and CN102 on the IF-715 board.
7. Attach the upper lid (Refer to Section 1-6).



## In the case of one power-cooling-fan

### Removal

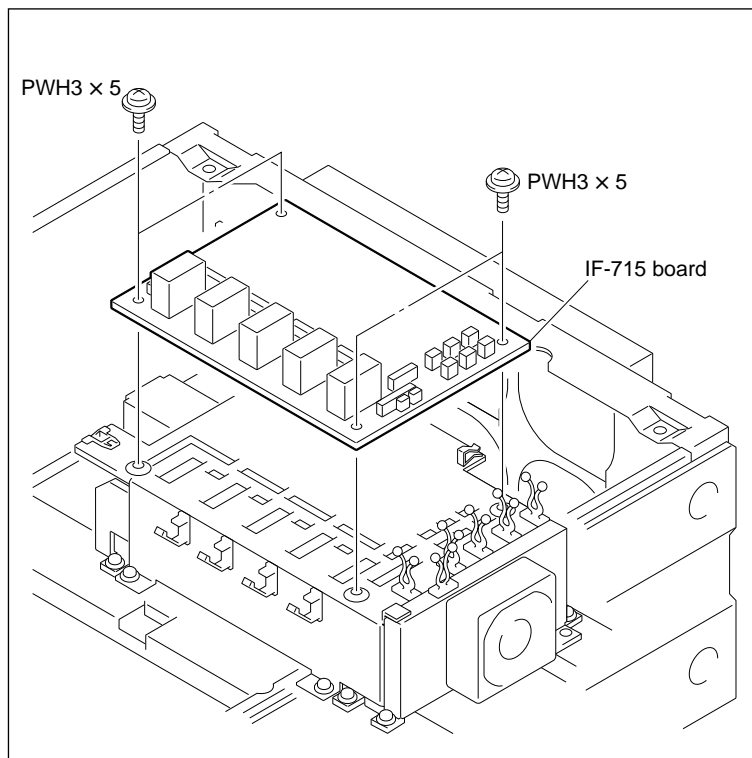
1. Turn off the power and wait for more than 30 seconds.
2. Remove the upper lid. (Refer to Section 1-6.)
3. Disconnect all harnesses on the IF-715 board.
  - ① Free the six harnesses of fans 1 to 6 from clampers ① and remove them.
  - ② Disconnect the POWER IN harness.
  - ③ Disconnect the 12 harnesses which are connected to the HDD units. Free these harnesses from clampers ③.
  - ④ Disconnect the harness which is connected to the FP-104 board.
  - ⑤ Disconnect the harness of power-cooling-fan.



4. Unscrew the four screws.
5. Remove the IF-715 board with paying attention to avoid catching on the harness.

### Installation

Install in the reverse order of removal. However, for connection of harnesses of fans 1 to 6, refer to installation procedure 8 in “2-3. Replacement of Power Supply Unit” and connect it properly.





## 2-4-2. SE-378 Board

### Note

It is necessary to remove the HDD unit at replacing the SE-378 board. Handle the removed HDD unit following “Caution for Handling the Unit with Built-in HDD” (Mentioned after “Manual Structure”) paying sufficient attention to avoid subjecting the HDD unit to any shock.

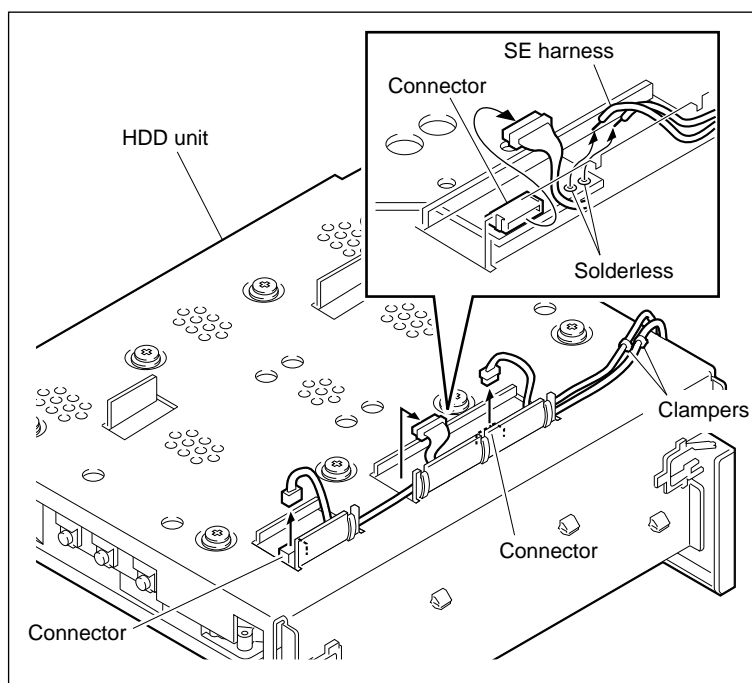
### Replacement

#### Removal

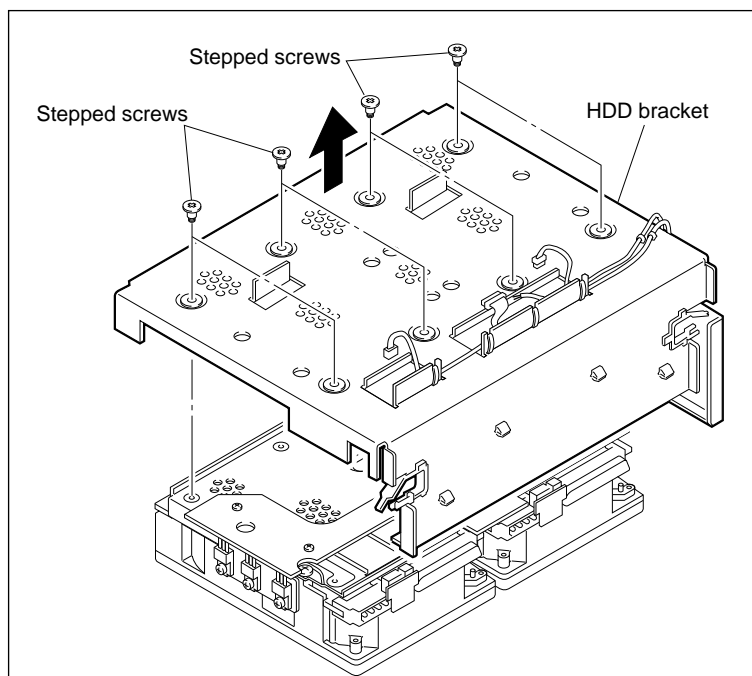
1. Turn off the power and wait for more than 30 seconds.
2. Lift off the HDD unit.  
(Refer to Section 2-2-2.)
3. Place the HDD unit gently on the HDD cushion with upside down. (Refer to (3) of removal procedure 2 in Section 2-2-3.)
4. Disconnect the three harnesses from the connectors shown in the figure.
5. Unsolder and remove the SE harness from the SE-378 board.

#### Note

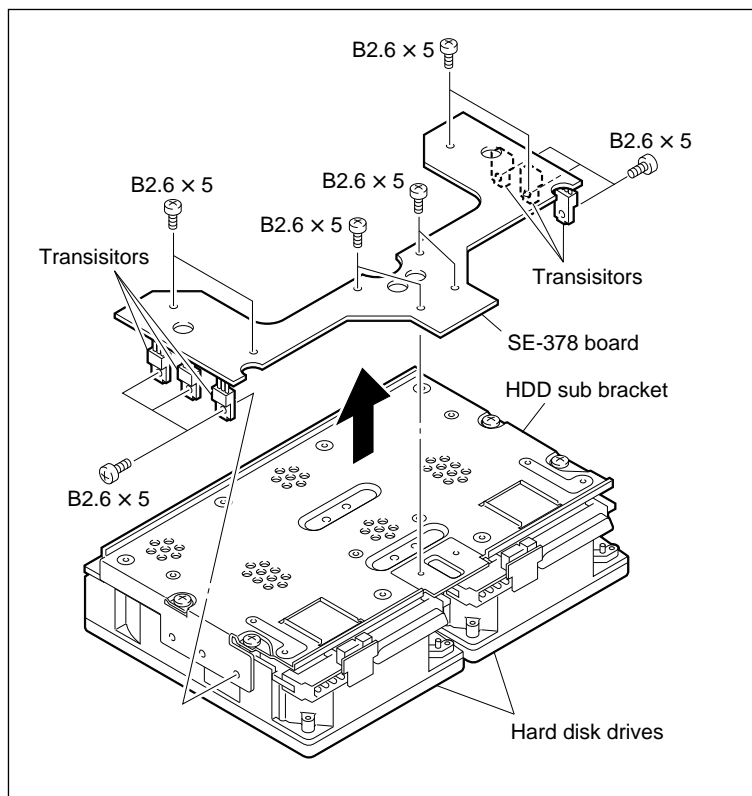
Never unbind the clampers on the HDD bracket.



6. Unscrew the eight stepped screws.
7. Lift up the HDD bracket and remove it.

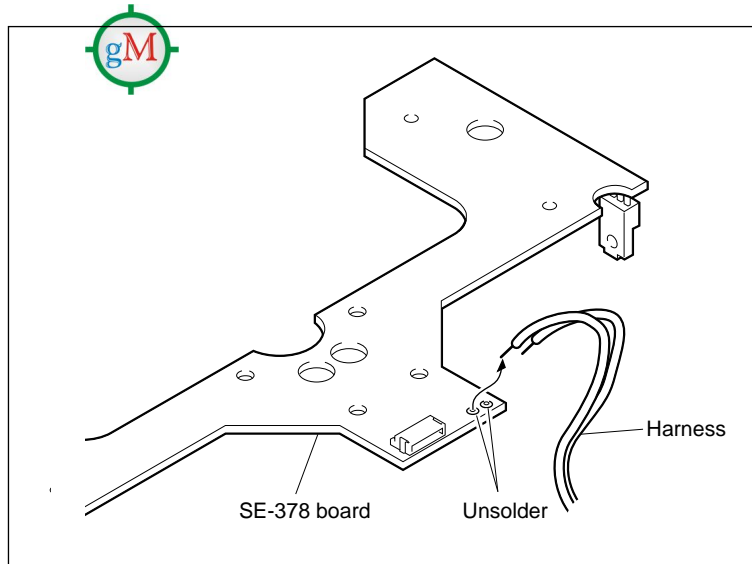


8. Unscrew the six screws which is fixing the transistors on the SE-378 board.
9. Unscrew the eight screws marked with  $\Rightarrow$  and remove the SE-378 board from the HDD sub bracket.

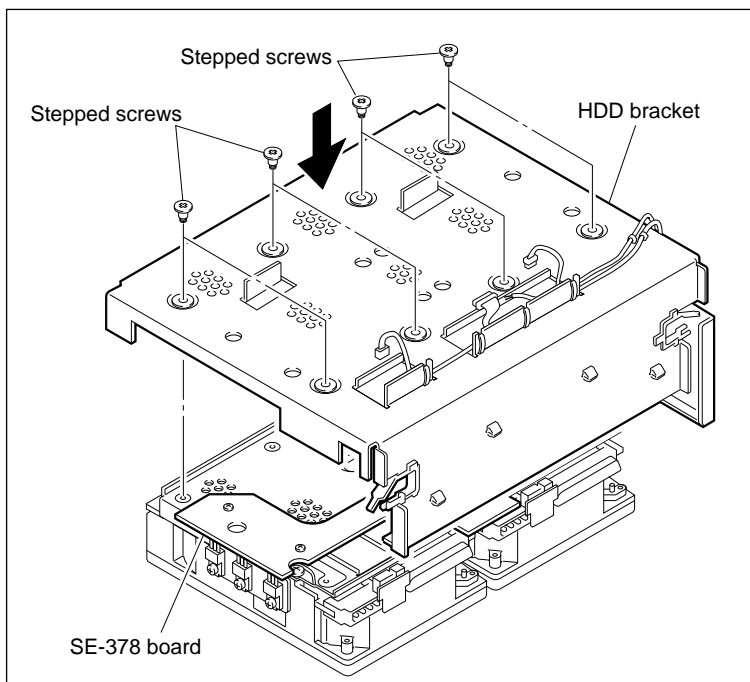


## Installation

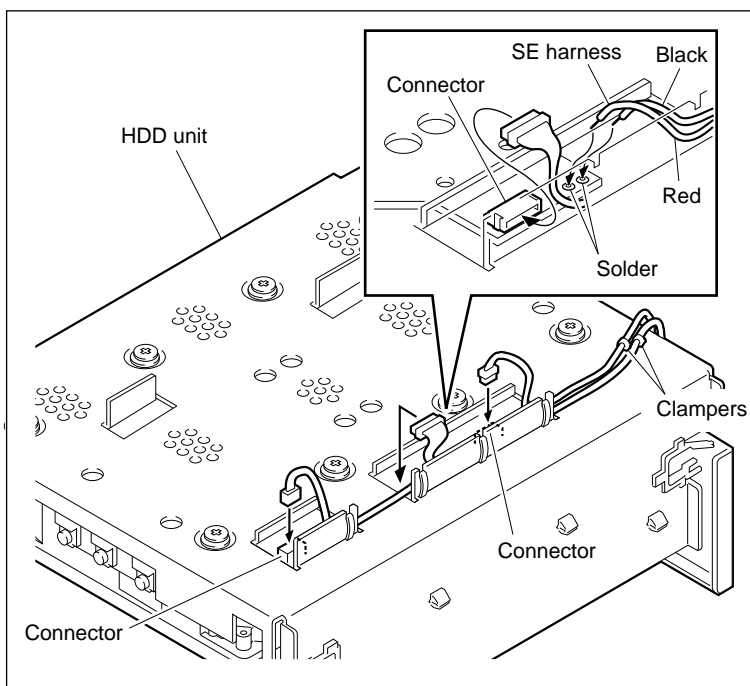
1. When installing the new SE-378 board, unsolder and remove the harness.
- Note**  
The removed harness here is not re-used.



2. Attach the SE-378 board and HDD bracket in reverse order from steps 6 to 9 of removal procedure.



3. Solder the SE harness which was unsoldered in removal step 5 on SE-378 board.
4. Connect the harnesses which was disconnected in removal step 4 to the connectors. (Three portions)
5. Install the HDD unit referring to "Installation" in Section 2-2-2.



## 2-4-3. CN-1667/1668 Boards

### Note

It is necessary to remove the HDD unit at replacing CN-1667/1668 boards. Handle the removed HDD unit following “Caution for Handling the Unit with Built-in HDD” (Mentioned after “Manual Structure”) paying sufficient attention to avoid subjecting the HDD unit to any shock.

### Replacement

#### Removal

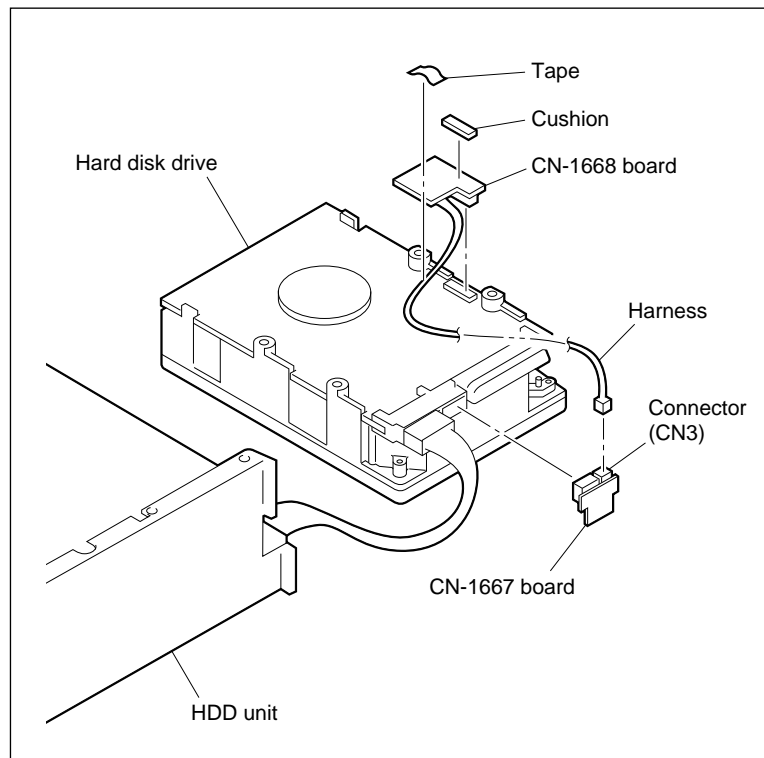
1. Turn off the power and wait for more than 30 seconds.
2. Remove the HDD unit.  
(Refer to Section 2-2-2.)
3. Remove the hard disk drive in procedure up to (6) of step 2 in Section 2-2-3.

#### • In the case of CN-1667 board

4. Disconnect the harness from the connector (CN3).
5. Remove the CN-1667 board from the hard disk drive.

#### • In the case of CN-1668 board

4. Peel off the tape.
5. Disconnect the harness from the connector (CN3) on the CN-1667 board.
6. Remove the CN-1668 board from the hard disk drive.
7. Peel off the cushion.



## Installation

- **In the case of CN-1667 board**

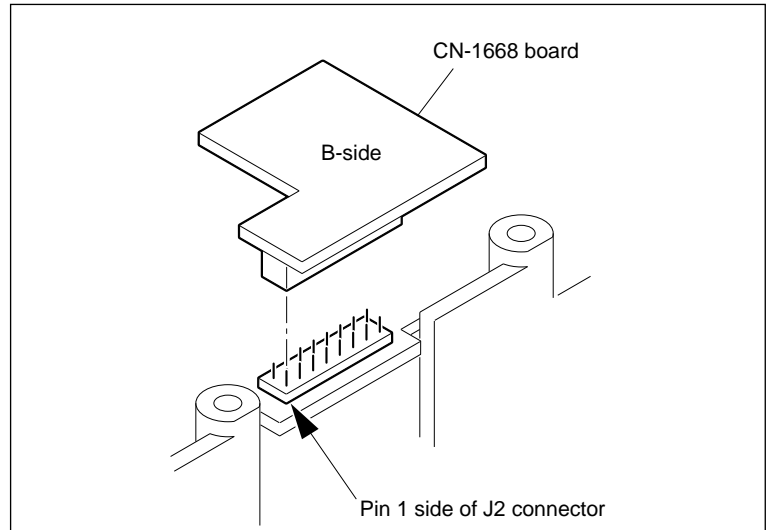
Install in reverse order from steps 2 to 5 of removal procedure.

- **In the case of CN-1668 board**

Install in reverse order from steps 2 to 7 of removal procedure. However, when connecting the CN-1668 board, align to pin 1 side of each connector.

**Note**

When fixing the harness with new tape, use the following tape with cutting it in 2.5 cm.  
Scotch electrical tape, flame-resistant film No.10  
(or equivalent)

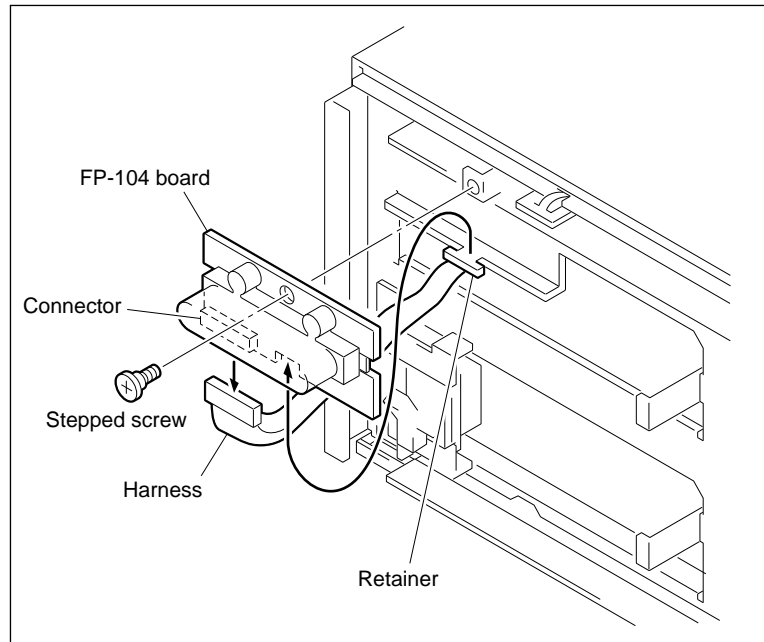


## 2-4-4. FP-104 Board

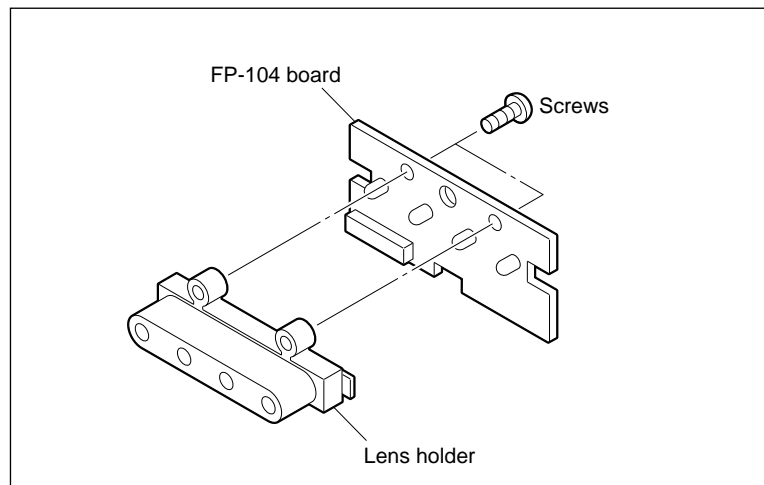
### Replacement

#### Removal

1. Turn off the power and wait for more than 30 seconds.
2. Remove the front panel.  
(Refer to Section 1-6.)
3. Unscrew the one stepped screw.
4. Remove the FP-104 board from the retainer of the front chassis.
5. Disconnect the harness from the connector.



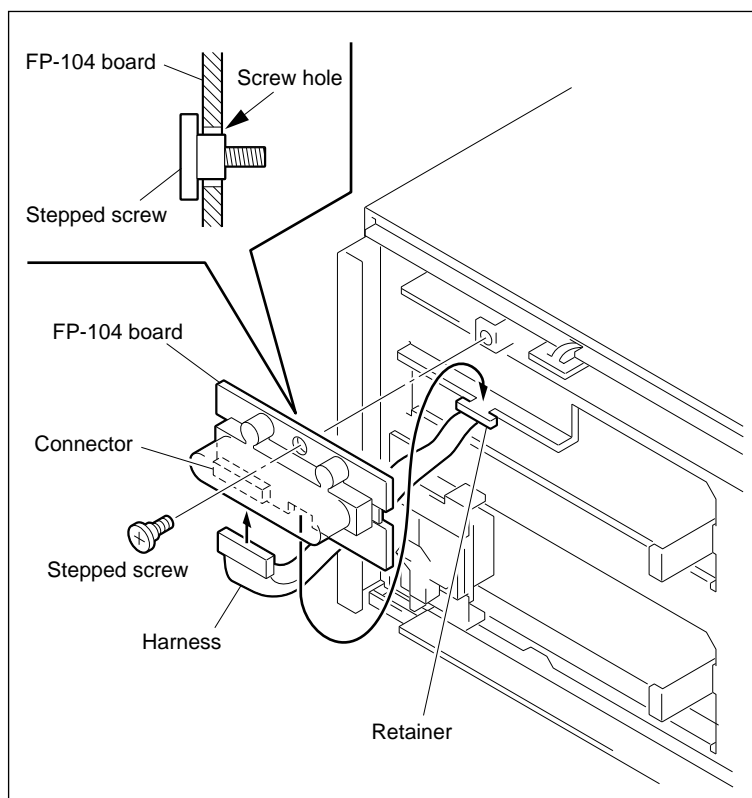
6. Unscrew the two screws on B side of the FP-104 board and remove the lens holder.



## Installation

Install in reverse order from steps 2 to 6 of removal procedure. However, pay attention to the following points when attaching the FP-104 board with screws.

- As shown in the figure, fit a stepped screw in screw hole of the FP-104 board.
- Check that the board moves as clearance between screw and stepped screw hole.

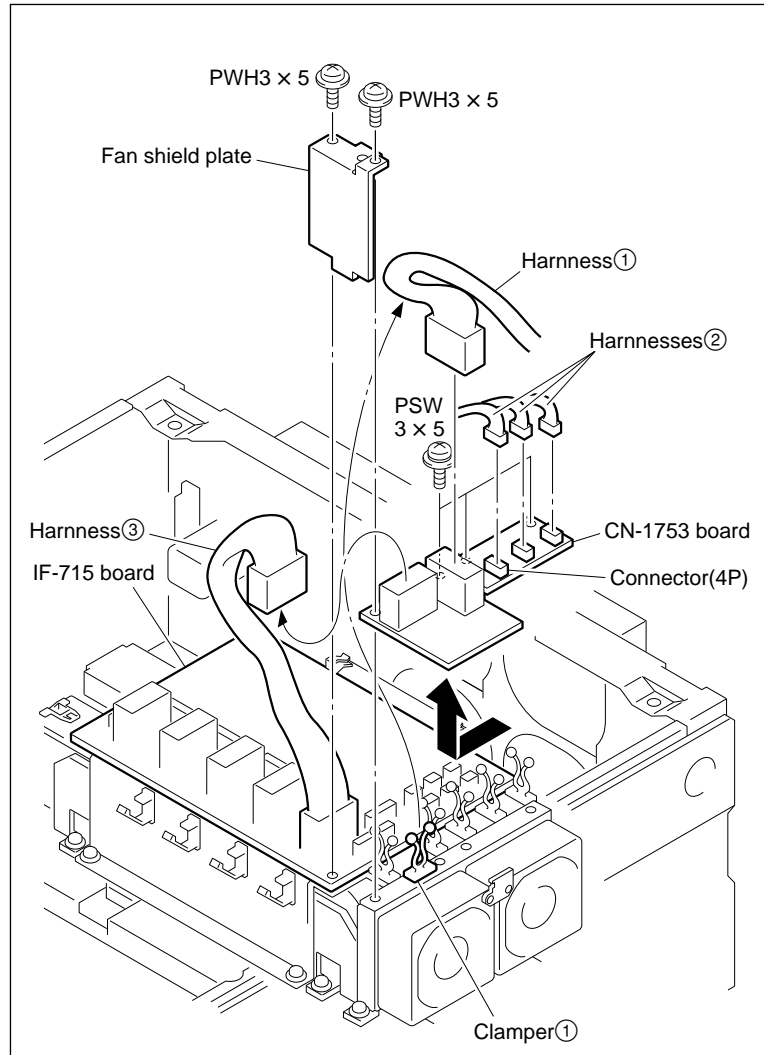


**Note**

CN-1753 board is applicable to only the unit which serial No. is 10001 through 10052.

**Removal**

1. Turn off the power and wait for more than 30 seconds.
2. Remove the upper lid. (Refer to Section 1-6.)
3. Free the harness ① from clamber ①.
4. Disconnect the harnesses ①, ② and ③ from the connectors on the CN-1753 board.
5. Unscrew the five screws and remove the fan shield plate.
6. Move the CN-1753 board in the direction of the arrow and remove it.





---

## Installation

### 1. In the case of reparable the CN-1753 board.

Install the CN-1753 board in reverse order from steps 2 to 6 of removal procedure.

### 2. In the case of irreparable the CN-1753 board

The CN-1753 board is not able to supply as spare parts. Therefore deal as shown below when it is impossible to repair the CN-1753 board.

#### Note

The CN-1753 board is required when attaching the fan shield plate. Never throw away the CN-1753 board if it is irreparable. If there is not the CN-1753 board, the fan shield plate is not fixed properly because the clearance appears between the fan shield plate and fan bracket.

- (1) When the suffix of power supply unit is -12, replace it with the one of suffix is -13 and higher.

#### Note

Perform to step 6 of “2-3-1. In the Case of Two Power-Cooling-Fan”.

- (2) IF the suffix of IF-715 board is -11, replace it with the one of suffix is -12 and higher.  
(Refer to “In the case of two Power-cooling-fan” of Section 2-4-1.)
- (3) Disconnect the harness ③ from CN1 on the IF-715 board.

#### Note

This harness is not need.

- (4) Connect the harness of power supply unit (Harness ① in the figure) to CN1 on the IF-715 board.

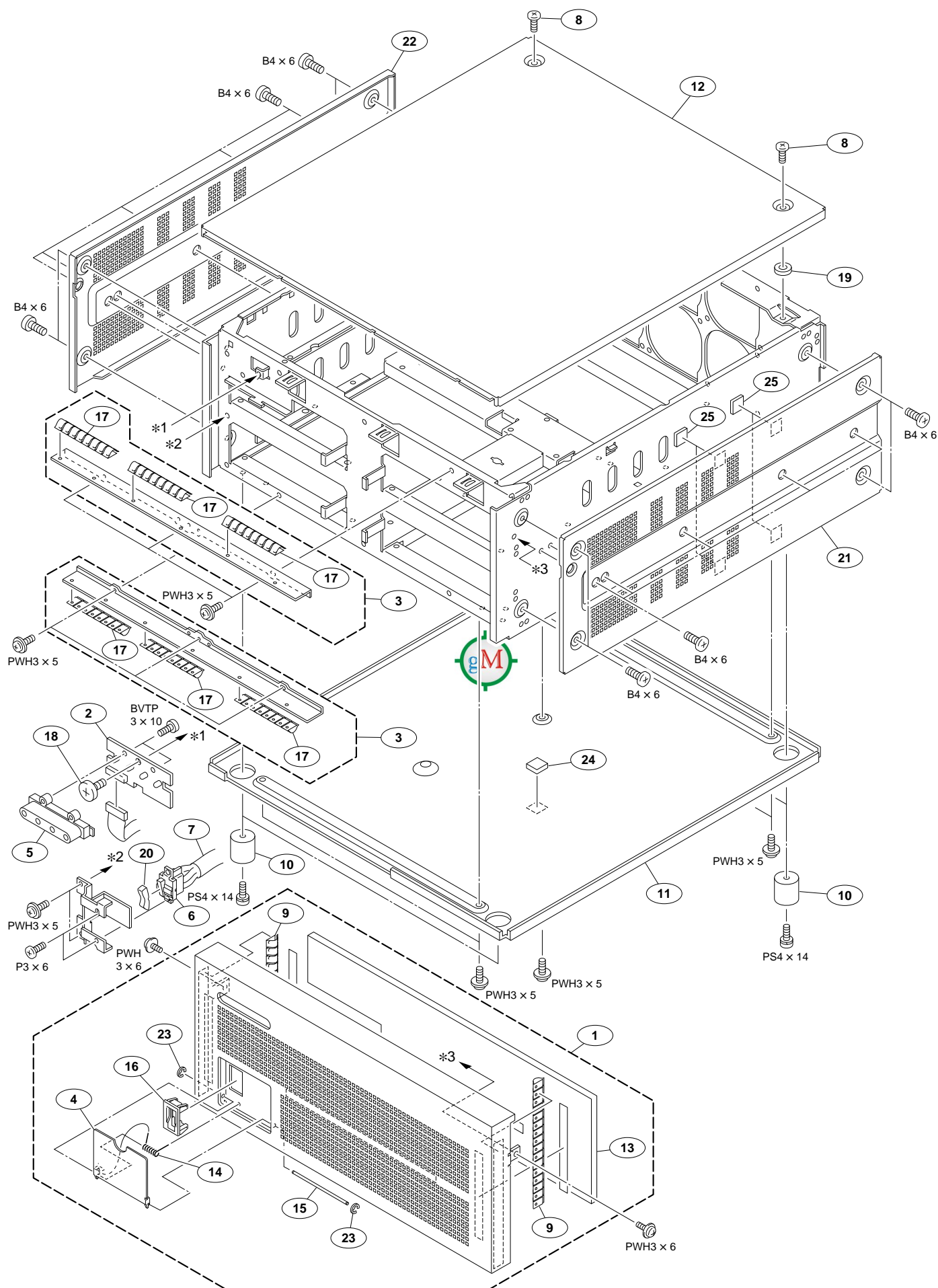


**Section 3**  
**Spare Parts**

**3-1. Exploded Views**

<b>Title</b>	<b>Page</b>
Cabinet, front side	3-2
IF-715 board, power supply unit	3-4
HDD unit assembly (1) (4)	3-6
HDD unit assembly (2) (3)	3-8
Rear side	3-10
Screws	3-12

# Cabinet, front side

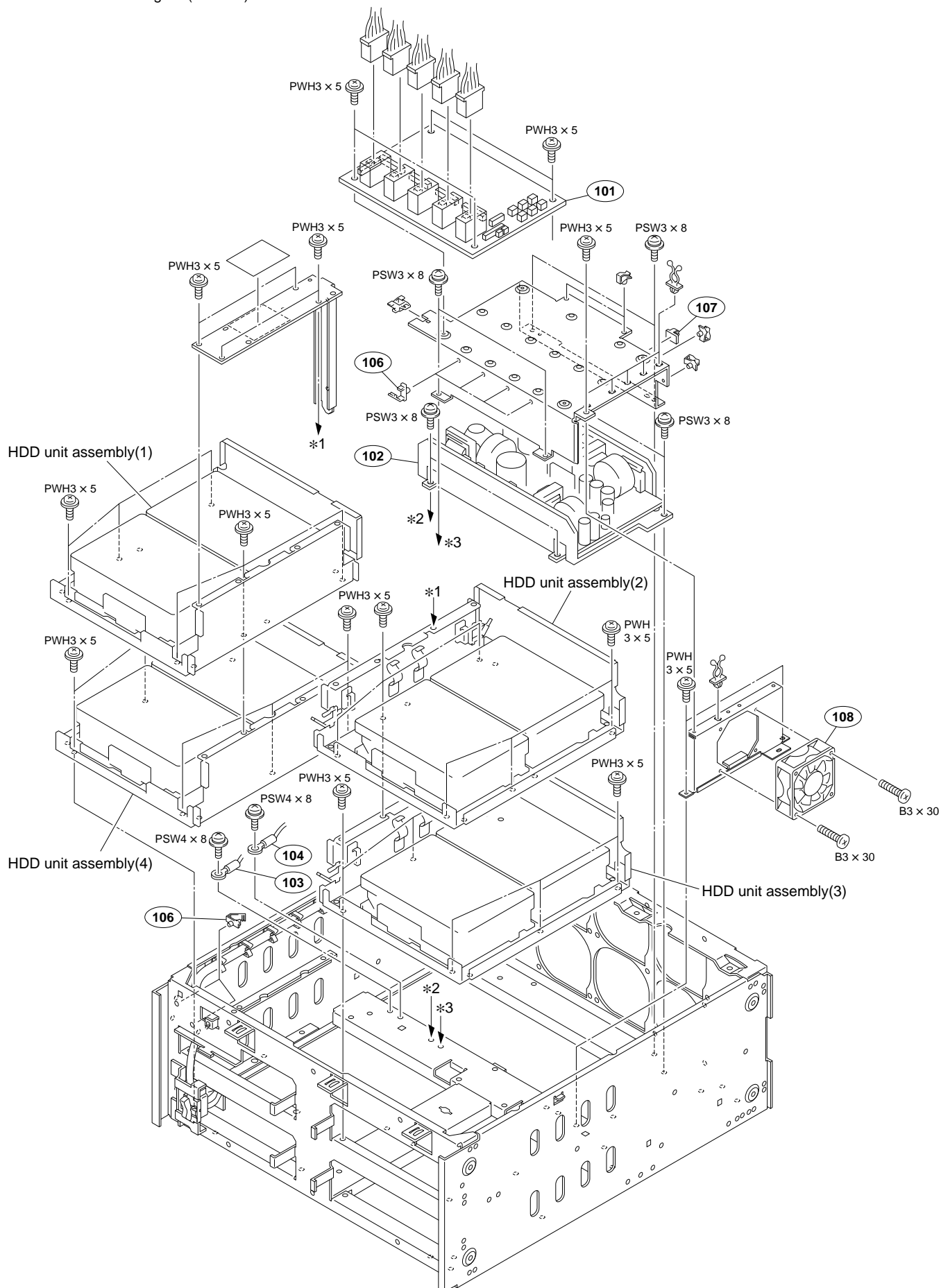


No.	Part No.	SP Description
1	A-8278-839-B	o PANEL (A) ASSY, FRONT
2	A-8318-792-A	o MOUNTED CIRCUIT BOARD, FP-104
3	X-3604-641-1	o PLATE ASSY, FR GROUND
4	X-3604-646-1	o DOOR ASSY, POWER SW
5	X-3678-903-2	o ASSY, HOLDER, LENS
6	1-762-953-11	s SWITCH, POWER
7	1-958-650-11	o HARNESS, SUB (AC POWER SW)
8	3-174-264-01	s SCREW (+) (B4X8) (CU,NI)
9	3-188-119-01	o FINGERS, SHIELD
10	3-604-930-02	s FOOT, RUBBER
11	3-613-619-01	o PLATE, BOTTOM
12	3-613-621-02	o LID UPPER
13	3-613-622-02	s FILTER
14	3-615-579-01	s SPRING2
15	3-615-585-01	s SHAFT, DOOR, SW
16	3-681-054-11	s POWER SW GUARD
17	3-686-159-01	o SHIELD FINGERS (B)
18	3-687-263-01	s SCREW, STEP
19	3-688-102-01	o SPACER, M4
20	3-688-814-31	s CAP, SWITCH
21	3-697-443-02	o CABINET(R)
22	3-697-444-02	o CABINET(L)
23	7-624-102-04	s STOP RING 1.5, TYPE-E
24	2-353-825-03	o CUSHION
25	3-615-985-01	o SIDE PANEL PAD

# IF-715 board, power supply unit

Serial No. 10053 and higher (SY model)

Serial No. 30006 and higher (J model)



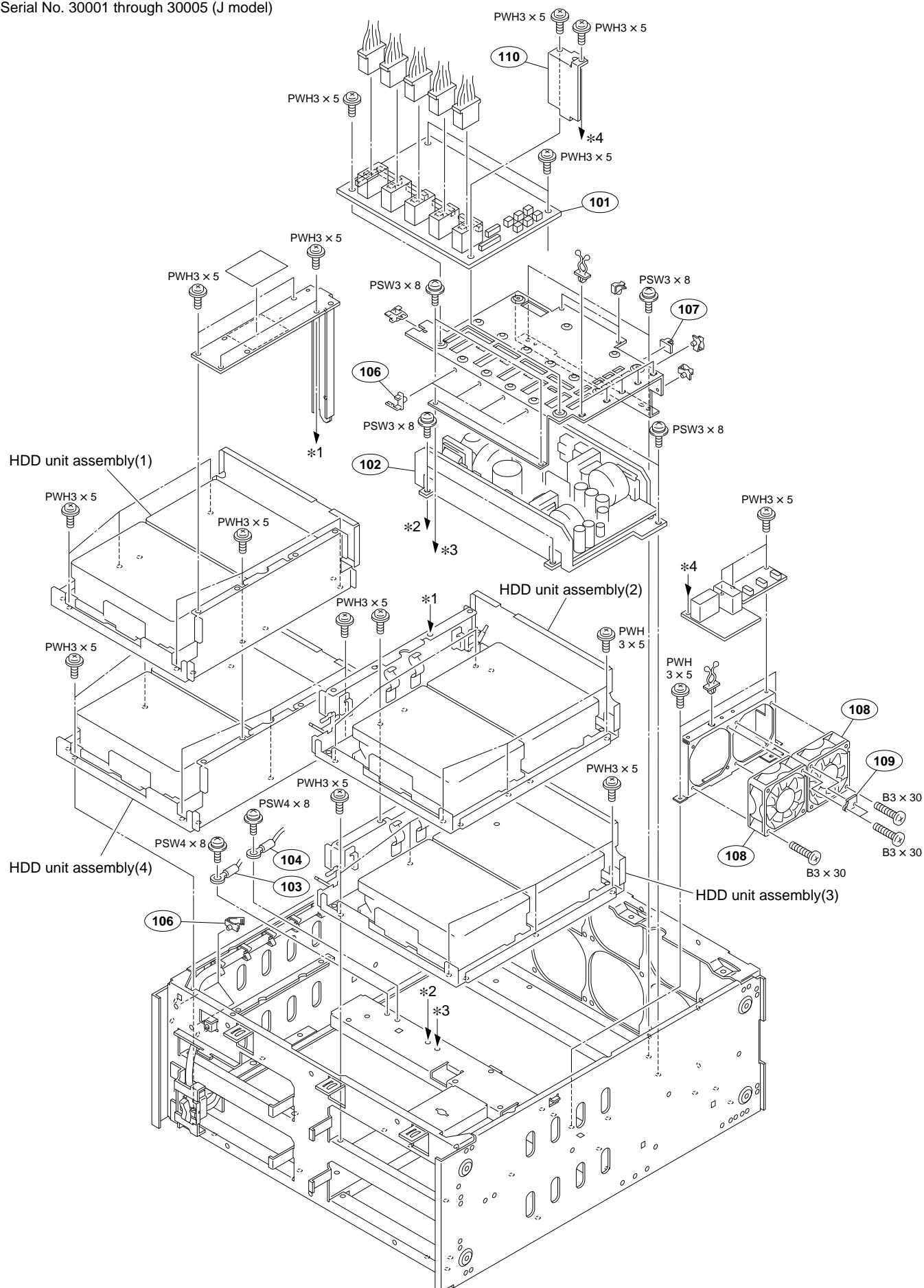
Serial No. 10053 and higher (SY model)  
Serial No. 30006 and higher (J model)

No.	Part No.	SP Description
101	A-8318-791-A	o MOUNTED CIRCUIT BOARD, IF-715
102	1-468-134-13	s REGULATOR, SWITCHING
103	1-958-651-11	o HARNESS, SUB (GROUND 1)
104	1-958-652-11	o HARNESS, SUB (GROUND 2)
106	3-686-073-01	o CLAMP, HARNESS
107	4-617-314-01	o CLAMP
108	1-698-840-21	s FAN, DC (60 SQUARE)

# IF-715 board, power supply unit

Serial No. 10001 through 10052 (SY model)

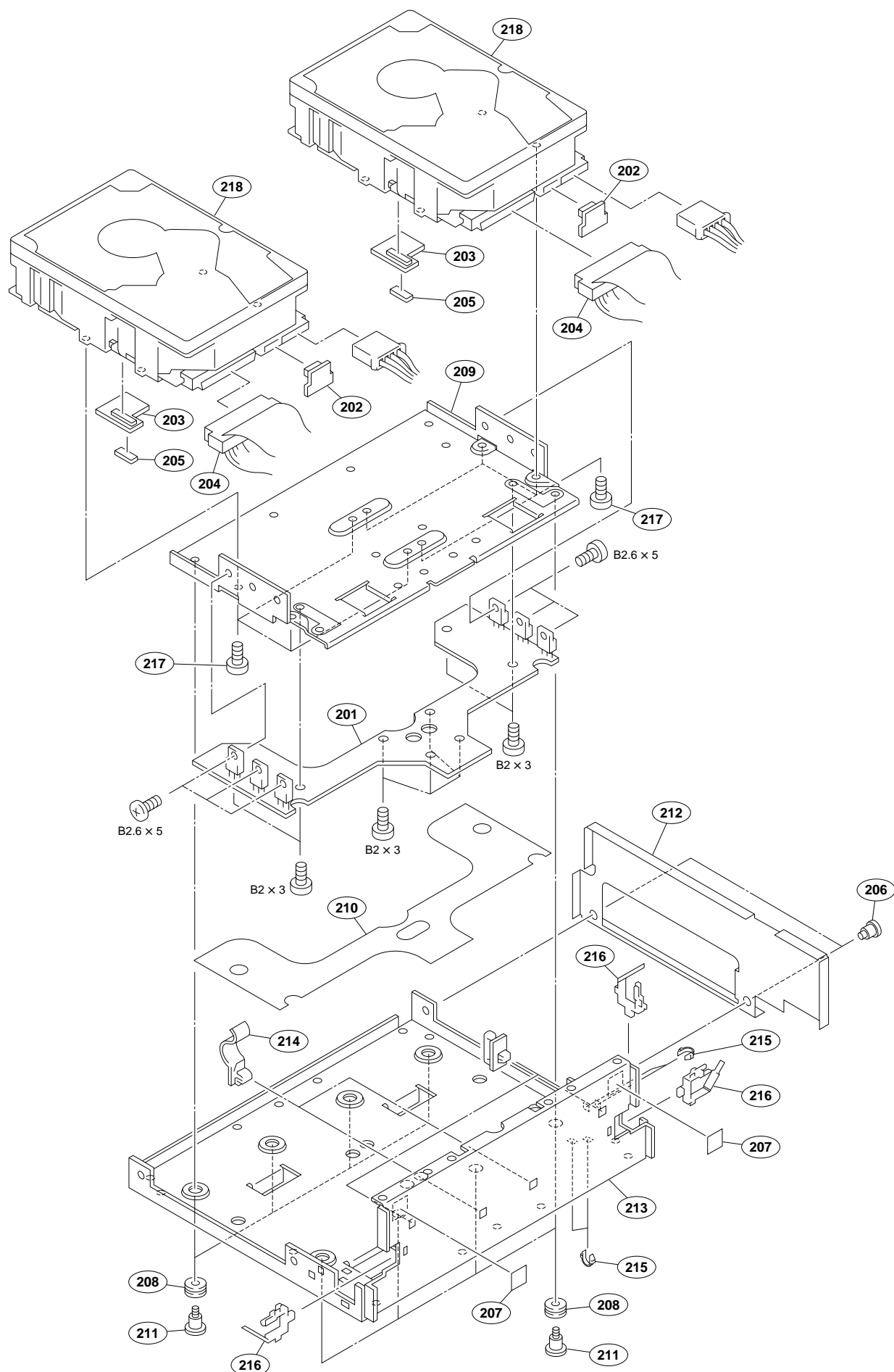
Serial No. 30001 through 30005 (J model)



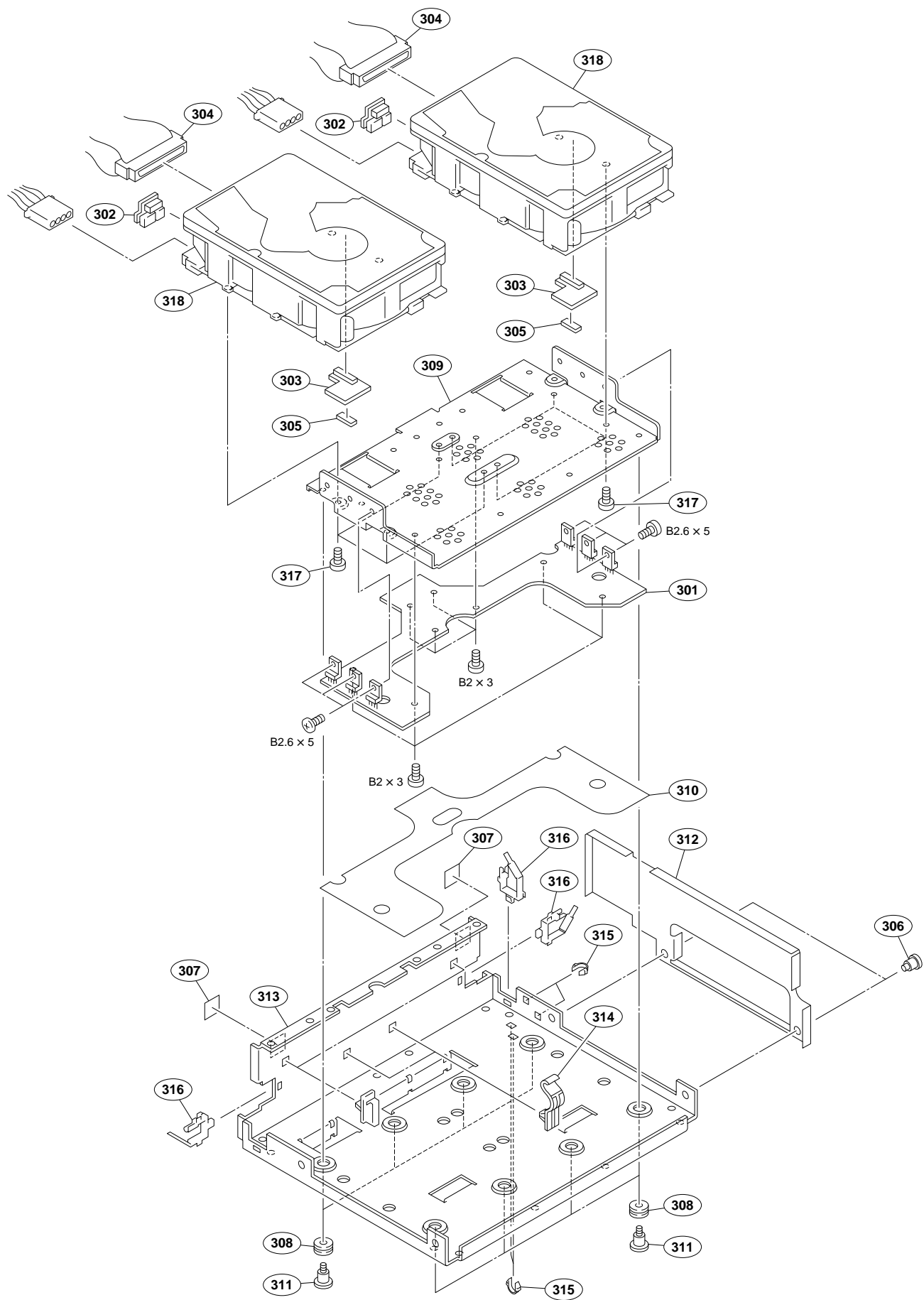


Serial No. 10001 through 10052 (SY model)  
Serial No. 30001 through 30005 (J model)

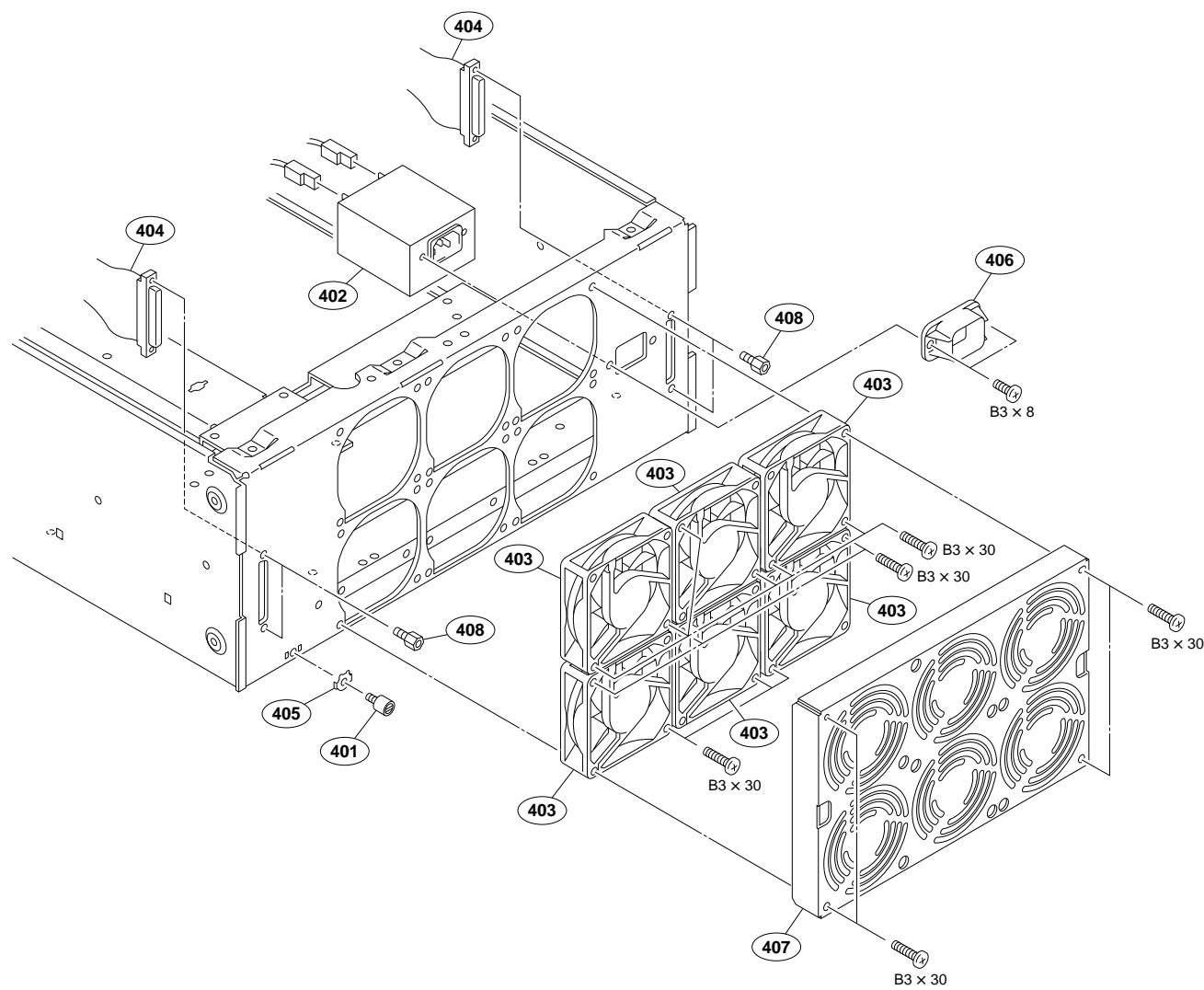
No.	Part No.	SP Description
101	A-8318-791-A	o MOUNTED CIRCUIT BOARD, IF-715
102	1-468-134-13	s REGULATOR, SWITCHING
103	1-958-651-11	o HARNESS, SUB (GROUND 1)
104	1-958-652-11	o HARNESS, SUB (GROUND 2)
106	3-686-073-01	o CLAMP, HARNESS
107	4-617-314-01	o CLAMP
108	1-698-840-21	s FAN, DC (60 SQUARE)
109	3-615-983-01	o CN HOLDER
110	3-615-984-01	o PLATE, FAN SHIELD



No.	Part No.	SP	Description
201	A-8312-119-A	o	MOUNTED CIRCUIT BOARD, SE-378
202	A-8318-793-A	o	MOUNTED CIRCUIT BOARD, CN-1667
203	A-8318-794-A	o	MOUNTED CIRCUIT BOARD, CN-1668
204	1-783-552-11	o	CABLE ASSEMBLY, FLAT 68P SCSI
205	3-154-113-01	s	CUSHION
206	3-531-576-01	s	RIVET
207	3-615-751-01	o	LABEL, HDD ID NUMBER
208	3-606-112-01	o	GROMETT
209	3-606-113-02	o	BRACKET(SUB), HDD
210	3-606-424-02	o	SHEET, PROTECTION
211	3-609-748-01	s	SCREW (M3)
212	3-613-796-02	o	AEROPLATE L
213	3-613-802-02	o	BRACKET, HDD
214	3-646-076-00	o	CLIP, CABLE (7R)
215	3-660-815-01	o	CLIP, CABLE
216	4-316-015-00	o	HOLDER, WIRE
217	4-613-955-11	s	SCREW +B6-32 (UNC)
218	A-8319-932-A	s	HDD ASSY (RP)



No.	Part No.	SP Description
301	A-8312-119-A	o MOUNTED CIRCUIT BOARD, SE-378
302	A-8318-793-A	o MOUNTED CIRCUIT BOARD, CN-1667
303	A-8318-794-A	o MOUNTED CIRCUIT BOARD, CN-1668
304	1-783-552-11	o CABLE ASSEMBLY, FLAT 68P SCSI
305	3-154-113-01	s CUSHION
306	3-531-576-01	s RIVET
307	3-615-751-01	o LABEL, HDD ID NUMBER
308	3-606-112-01	o GROMETT
309	3-606-113-02	o BRACKET(SUB), HDD
310	3-606-424-02	o SHEET, PROTECTION
311	3-609-748-01	s SCREW (M3)
312	3-613-795-02	o AEROPLATE R
313	3-613-802-02	o BRACKET, HDD
314	3-646-076-00	o CLIP, CABLE (7R)
315	3-660-815-01	o CLIP, CABLE
316	4-316-015-00	o HOLDER, WIRE
317	4-613-955-11	s SCREW +B6-32 (UNC)
318	A-8319-932-A	s HDD ASSY (RP)



No.	Part No.	SP	Description
401	X-2068-004-0	s	TERMINAL ASSY
402	1-424-451-11	s	FILTER, NOISE (GL-2060M) "AC INLET"
403	1-698-812-21	s	FAN, DC (80 SQUARE)
404	1-783-552-11	o	CABLE ASSEMBLY, FLAT 68P SCSI
405	2-068-008-00	s	WASHER
406	2-990-241-02	s	HOLDER (A), PLUG
407	X-3604-653-1	o	COVER, FAN ASSY
408	3-696-798-01	s	SCREW

Part No.	SP Description
7-621-770-87	s SCREW +B 2.6X5
7-621-772-08	s SCREW +B 2X3
7-682-147-01	s SCREW +P 3X6
7-682-548-09	s SCREW +B 3X8, BLACK
7-682-555-09	s SCREW +B 3X30
7-682-560-04	o SCREW +B 4X6
7-682-664-01	s SCREW +PS 4X14
7-682-903-01	s SCREW +PWH 3X5
7-682-903-19	s SCREW +PWH 3X6, BLACK
7-682-948-01	s SCREW +PSW 3X8
7-682-961-09	s SCREW +PSW 4X8
7-685-647-79	s SCREW +BVTP 3X10 TYPE2, IT-3



## 3-2. Electrical Parts List

### 3-2-1. Frame Parts List

Ref. No. or Q'ty	Part No.	SP Description
8pcs	A-8319-932-A	s HDD ASSY (RP)
1pc	△ 1-468-134-13	s SWITCHING REGULATOR
*1	△ 1-468-134-12	s SWITCHING REGULATOR
1pc	△ 1-424-451-11	s FILTER, NOISE (GL-2060M) "AC INLET"
1pc	1-783-552-11	o CABLE ASSEMBLY, FLAT 68P SCSI
FAN1	1-698-812-21	s FAN, DC (80 SQUARE)
FAN2	1-698-812-21	s FAN, DC (80 SQUARE)
FAN3	1-698-812-21	s FAN, DC (80 SQUARE)
FAN4	1-698-812-21	s FAN, DC (80 SQUARE)
FAN5	1-698-812-21	s FAN, DC (80 SQUARE)
FAN6	1-698-812-21	s FAN, DC (80 SQUARE)
FAN7	1-698-840-21	s FAN, DC (60 SQUARE)
FAN8	*1 1-698-840-21	s FAN, DC (60 SQUARE)
S001	△ 1-958-650-11	o HARNESS, AC POWER SW "POWER SWITCH"

### 3-2-2. Cable and Harness List

Ref. No. or Q'ty	Part No.	SP Description
		to AC INLET
1pc	△ 1-958-651-12	o HARNESS, GROUND 1
1pc	1-958-650-12	o HARNESS, AC POWER SW
		to CN-1667 board
CN2	1-580-580-11	o HOUSING, LY 8P
8pcs	1-580-599-11	o CONTACT, LY, FEMALE, AWG22-30
CN3	1-580-578-11	s HOUSING, LY 4P
4pcs	1-580-599-11	o CONTACT, LY, FEMALE, AWG22-30
		to CN-1753 board *1
CN1	1-569-196-11	o HOUSING, 3P
3pcs	1-569-193-11	o CONTACT, FEMALE, AWG24-30
CN2	1-569-197-11	o HOUSING, 4P
4pcs	1-569-193-11	o CONTACT, FEMALE, AWG24-30
CN3	1-569-196-11	o HOUSING, 3P
3pcs	1-569-193-11	o CONTACT, FEMALE, AWG24-30
CN4	1-778-252-11	o HOUSING, 10P
10pcs	1-694-280-11	o CONTACT, FEMALE, AWG16-20
CN5	1-778-252-11	o HOUSING, 10P
10pcs	1-694-280-11	o CONTACT, FEMALE, AWG16-20
		to FP-104 board
CN1	1-569-205-11	o HOUSING, 12P
12pcs	1-569-193-11	o CONTACT, FEMALE, AWG24-30
		to HARD DISK DRIVE
J1	1-783-552-11	o CABLE ASSEMBLY, FLAT 68P SCSI
J1-DC	1-508-424-11	o HOUSING, AC 4P
4pcs	1-535-714-11	o CONTACT, AC, FEMALE

\*1: Serial No. 10001 through 10052 only (for SY model)  
Serial No. 30001 through 30005 only (for J model)

Ref. No. or Q'ty	Part No.	SP Description
to IF-715 board		
CN1 10pcs	1-778-252-11 1-694-280-11	o HOUSING, 10P o CONTACT, FEMALE, AWG16-20
CN2 12pcs	1-569-205-11 1-569-193-11	o HOUSING, 12P o CONTACT, FEMALE, AWG24-30
CN3 3pcs	1-562-505-11 1-562-490-11	s HOUSING, 3P o CONTACT, FEMALE, AWG22-28
CN4 3pcs	1-562-505-11 1-562-490-11	s HOUSING, 3P o CONTACT, FEMALE, AWG22-28
CN5 3pcs	1-562-505-11 1-562-490-11	s HOUSING, 3P o CONTACT, FEMALE, AWG22-28
CN6 3pcs	1-562-505-11 1-562-490-11	s HOUSING, 3P o CONTACT, FEMALE, AWG22-28
CN7 3pcs	1-562-505-11 1-562-490-11	s HOUSING, 3P o CONTACT, FEMALE, AWG22-28
CN8 3pcs	1-562-505-11 1-562-490-11	s HOUSING, 3P o CONTACT, FEMALE, AWG22-28
CN11 8pcs	1-778-252-11 1-694-280-11	o HOUSING, 10P o CONTACT, FEMALE, AWG16-20
CN12 23pcs	1-580-588-11 1-580-599-11	o HOUSING, LY 24P o CONTACT, LY, FEMALE, AWG22-30
CN13 2pcs	1-561-514-00 1-560-372-00	o HOUSING, IL-G 2P o CONTACT, IL-G, FEMALE, AWG22-28
CN21 8pcs	1-778-252-11 1-694-280-11	o HOUSING, 10P o CONTACT, FEMALE, AWG16-20
CN22 23pcs	1-580-589-11 1-580-599-11	o HOUSING, LY 26P o CONTACT, LY, FEMALE, AWG22-30
CN23 2pcs	1-561-514-00 1-560-372-00	o HOUSING, IL-G 2P o CONTACT, IL-G, FEMALE, AWG22-28
CN31 8pcs	1-778-252-11 1-694-280-11	o HOUSING, 10P o CONTACT, FEMALE, AWG16-20
CN32 23pcs	1-580-590-11 1-580-599-11	o HOUSING, LY 28P o CONTACT, LY, FEMALE, AWG22-30
CN33 2pcs	1-561-514-00 1-560-372-00	o HOUSING, IL-G 2P o CONTACT, IL-G, FEMALE, AWG22-28
CN41 8pcs	1-778-252-11 1-694-280-11	o HOUSING, 10P o CONTACT, FEMALE, AWG16-20
CN42 23pcs	1-580-591-11 1-580-599-11	o HOUSING, LY 30P o CONTACT, LY, FEMALE, AWG22-30
CN43 2pcs	1-561-514-00 1-560-372-00	o HOUSING, IL-G 2P o CONTACT, IL-G, FEMALE, AWG22-28
CN101*b 3pcs	1-569-196-11 1-569-193-11	o HOUSING, 3P o CONTACT, FEMALE, AWG24-30
CN102*b 3pcs	1-569-196-11 1-569-193-11	o HOUSING, 3P o CONTACT, FEMALE, AWG24-30

Ref. No. or Q'ty	Part No.	SP Description
to POWER SUPPLY UNIT		
CN1 1pc	Δ 1-958-650-12 Δ 1-958-652-12	o HARNESS, AC POWER SW o HARNESS, GROUND 2
to SE-378 board		
CN1 7pcs	1-565-979-11 1-565-977-11	o HOUSING, 8P s CONTACT, FEMALE, AWG28-32

b: BOARD No. suffix -12

**3-2-3. Each Board**-----  
CN-1667 BOARD  
-----

Ref. No. or Q'ty	Part No.	SP Description
1pc	A-8318-793-A	o MOUNTED CIRCUIT BOARD, CN-1667
CN2	1-580-559-11	o CONNECTOR, LY 8P, MALE
CN3	1-580-557-11	o CONNECTOR, LY 4P, MALE

-----  
CN-1668 BOARD  
-----

Ref. No. or Q'ty	Part No.	SP Description
1pc	A-8318-794-A	o MOUNTED CIRCUIT BOARD, CN-1668
1pc	1-580-578-11	s HOUSING, LY 4P
4pcs	1-580-599-11	o CONTACT, LY, FEMALE, AWG22-30
C1	1-163-038-00	s CERAMIC, CHIP 0.1uF 25V (2012)
C2	1-163-038-00	s CERAMIC, CHIP 0.1uF 25V (2012)
C3	1-163-038-00	s CERAMIC, CHIP 0.1uF 25V (2012)
C4	1-104-913-11	s TANTALUM, CHIP 10uF 20% 16V (3528)
CN1	1-784-895-11	o CONNECTOR, B-B 18P
Q1	8-729-027-59	s TRANSISTOR DTC144EKA
Q2	8-729-027-59	s TRANSISTOR DTC144EKA
Q3	8-729-027-59	s TRANSISTOR DTC144EKA
Q4	8-729-027-59	s TRANSISTOR DTC144EKA
Q5	8-729-117-32	s TRANSISTOR 2SC4177-L6
Q6	8-729-117-32	s TRANSISTOR 2SC4177-L6
R1	1-216-295-00	s METAL, CHIP 0 (2012)
R4	1-216-295-00	s METAL, CHIP 0 (2012)
R7	1-216-073-00	s METAL, CHIP 10K 5% 1/10W (2012)
R8	1-216-073-00	s METAL, CHIP 10K 5% 1/10W (2012)
R9	1-216-025-00	s METAL, CHIP 100 5% 1/10W (2012)
R10	1-216-025-00	s METAL, CHIP 100 5% 1/10W (2012)
R11	1-216-073-00	s METAL, CHIP 10K 5% 1/10W (2012)

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CN-1753 BOARD  
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Ref. No. or Q'ty	Part No.	SP Description
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This board is applicable to only the units of following Serial No.

Serial No. 10001 through 10052 only (for SY model)  
Serial No. 30001 through 30005 only (for J model)

C1	1-163-038-00	s CERAMIC, CHIP 0.1uF 25V (2012)
C2	1-163-038-00	s CERAMIC, CHIP 0.1uF 25V (2012)
C10	1-163-275-11	s CERAMIC, CHIP 1000pF 5% 50V (2012)
C11	1-126-382-11	s ELECT, 100uF 20% 16V
CN1	1-564-002-11	s CONNECTOR, 3P, MALE
CN2	1-506-469-11	s CONNECTOR, 4P, MALE
CN3	1-564-002-11	s CONNECTOR, 3P, MALE
CN4	1-778-249-11	o CONNECTOR, 10P, MALE
CN5	1-778-249-11	o CONNECTOR, 10P, MALE
IC10	8-729-040-75	s TRANSISTOR SI4953DY
IC11	8-729-040-75	s TRANSISTOR SI4953DY
IC12	8-729-040-75	s TRANSISTOR SI4953DY
IC13	8-729-040-75	s TRANSISTOR SI4953DY
IC14	8-729-040-75	s TRANSISTOR SI4953DY
IC15	8-729-040-75	s TRANSISTOR SI4953DY
Q1	8-729-027-59	s TRANSISTOR DTC144EKA
Q2	8-729-027-59	s TRANSISTOR DTC144EKA
Q10	8-729-027-59	s TRANSISTOR DTC144EKA
R1	1-216-093-00	s METAL, CHIP 68K 5% 1/10W (2012)
R2	1-216-093-00	s METAL, CHIP 68K 5% 1/10W (2012)
R10	1-216-001-00	s METAL, CHIP 10 5% 1/10W (2012)
R23	1-216-037-00	s METAL, CHIP 330 5% 1/10W (2012)
R22	1-216-073-00	s METAL, CHIP 10K 5% 1/10W (2012)
R24	1-216-085-00	s METAL, CHIP 33K 5% 1/10W (2012)

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FP-104 BOARD  
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Ref. No. or Q'ty	Part No.	SP Description
1pc	A-8318-792-A	o MOUNTED CIRCUIT BOARD, FP-104
C1	1-163-038-00	s CERAMIC, CHIP 0.1uF 25V (2012)
C2	1-163-038-00	s CERAMIC, CHIP 0.1uF 25V (2012)
C3	1-163-038-00	s CERAMIC, CHIP 0.1uF 25V (2012)
C4	1-135-179-21	s TANTALUM, CHIP 2.2uF 10% 16V (3216)
CN1	1-506-491-11	s CONNECTOR, 12P, MALE
D1	8-719-920-05	s LED SLP281C-50, GRN
D2	8-719-812-31	s LED TLR123, RED
D3	8-719-812-32	s LED TLY123, YEL
D4	8-719-812-32	s LED TLY123, YEL
D5	8-719-104-34	s DIODE 1S2835
D6	8-719-104-34	s DIODE 1S2835
D7	8-719-104-34	s DIODE 1S2835
D8	8-719-104-34	s DIODE 1S2835
Q1	8-729-027-59	s TRANSISTOR DTC144EKA
Q2	8-729-027-59	s TRANSISTOR DTC144EKA
Q3	8-729-027-38	s TRANSISTOR DTA144EKA
R1	1-216-033-00	s METAL, CHIP 220 5% 1/10W (2012)
R2	1-216-033-00	s METAL, CHIP 220 5% 1/10W (2012)
R3	1-216-033-00	s METAL, CHIP 220 5% 1/10W (2012)
R5	1-216-033-00	s METAL, CHIP 220 5% 1/10W (2012)
R6	1-216-025-00	s METAL, CHIP 100 5% 1/10W (2012)
R7	1-216-025-00	s METAL, CHIP 100 5% 1/10W (2012)
R8	1-216-025-00	s METAL, CHIP 100 5% 1/10W (2012)
R9	1-216-025-00	s METAL, CHIP 100 5% 1/10W (2012)
R10	1-216-025-00	s METAL, CHIP 100 5% 1/10W (2012)
R11	1-216-025-00	s METAL, CHIP 100 5% 1/10W (2012)
R12	1-216-025-00	s METAL, CHIP 100 5% 1/10W (2012)
R13	1-216-025-00	s METAL, CHIP 100 5% 1/10W (2012)

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IF-715 BOARD  
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Ref. No. or Q'ty	Part No.	SP Description
1pc	A-8318-791-A	o MOUNTED CIRCUIT BOARD, IF-715
C1	1-126-396-11	s ELECT, CHIP 47uF 20% 16V
C2	1-163-038-00	s CERAMIC, CHIP 0.1uF 25V (2012)
C3	1-127-519-11	s ELECT, 100uF 20% 20V
C4	1-163-038-00	s CERAMIC, CHIP 0.1uF 25V (2012)
C5	1-163-038-00	s CERAMIC, CHIP 0.1uF 25V (2012)
C6	1-163-038-00	s CERAMIC, CHIP 0.1uF 25V (2012)
C7	1-163-038-00	s CERAMIC, CHIP 0.1uF 25V (2012)
C8	1-163-038-00	s CERAMIC, CHIP 0.1uF 25V (2012)
C9	1-163-038-00	s CERAMIC, CHIP 0.1uF 25V (2012)
C10	1-163-038-00	s CERAMIC, CHIP 0.1uF 25V (2012)
C11	*b 1-104-913-11	s TANTALUM, CHIP 10uF 20% 16V (3528)
	*a 1-131-353-21	s TANTALUM 10uF 10% 35V
C12	1-163-038-00	s CERAMIC, CHIP 0.1uF 25V (2012)
C13	1-163-038-00	s CERAMIC, CHIP 0.1uF 25V (2012)
C14	1-104-913-11	s TANTALUM, CHIP 10uF 20% 16V (3528)
C15	1-104-913-11	s TANTALUM, CHIP 10uF 20% 16V (3528)
C16	1-163-038-00	s CERAMIC, CHIP 0.1uF 25V (2012)
C17	1-104-913-11	s TANTALUM, CHIP 10uF 20% 16V (3528)
C18	1-104-913-11	s TANTALUM, CHIP 10uF 20% 16V (3528)
C19	1-104-913-11	s TANTALUM, CHIP 10uF 20% 16V (3528)
C20	1-163-038-00	s CERAMIC, CHIP 0.1uF 25V (2012)
C21	1-163-038-00	s CERAMIC, CHIP 0.1uF 25V (2012)
C22	1-163-038-00	s CERAMIC, CHIP 0.1uF 25V (2012)
C23	1-163-038-00	s CERAMIC, CHIP 0.1uF 25V (2012)
C24	1-163-038-00	s CERAMIC, CHIP 0.1uF 25V (2012)
C25	1-104-913-11	s TANTALUM, CHIP 10uF 20% 16V (3528)
C26	1-104-913-11	s TANTALUM, CHIP 10uF 20% 16V (3528)
C27	1-126-935-11	s ELECT 470uF 20% 16V
C28	1-163-038-00	s CERAMIC, CHIP 0.1uF 25V (2012)
C29	1-163-038-00	s CERAMIC, CHIP 0.1uF 25V (2012)
C30	1-163-038-00	s CERAMIC, CHIP 0.1uF 25V (2012)
C31	1-163-038-00	s CERAMIC, CHIP 0.1uF 25V (2012)
C32	1-163-038-00	s CERAMIC, CHIP 0.1uF 25V (2012)
C33	1-163-038-00	s CERAMIC, CHIP 0.1uF 25V (2012)
C34	1-163-038-00	s CERAMIC, CHIP 0.1uF 25V (2012)
C35	1-163-038-00	s CERAMIC, CHIP 0.1uF 25V (2012)
C36	1-163-037-11	s CERAMIC, CHIP 0.022uF 10% 25V(2012)
C37	1-163-038-00	s CERAMIC, CHIP 0.1uF 25V (2012)
C38	1-126-934-11	s ELECT 220uF 20% 16V
C39	1-163-038-00	s CERAMIC, CHIP 0.1uF 25V (2012)
C40	1-163-038-00	s CERAMIC, CHIP 0.1uF 25V (2012)
C41	1-163-038-00	s CERAMIC, CHIP 0.1uF 25V (2012)
C42	1-126-934-11	s ELECT 220uF 20% 16V
C43	1-126-396-11	s ELECT, CHIP 47uF 20% 16V
C44	1-163-038-00	s CERAMIC, CHIP 0.1uF 25V (2012)
C45	1-163-038-00	s CERAMIC, CHIP 0.1uF 25V (2012)
C46	1-163-038-00	s CERAMIC, CHIP 0.1uF 25V (2012)
C47	1-126-396-11	s ELECT, CHIP 47uF 20% 16V
C48	1-163-038-00	s CERAMIC, CHIP 0.1uF 25V (2012)
C49	1-127-518-11	s ALUMN SOLID 100uF 20% 16V
C50	1-163-038-00	s CERAMIC, CHIP 0.1uF 25V (2012)
C51	1-163-038-00	s CERAMIC, CHIP 0.1uF 25V (2012)
C100	1-163-038-00	s CERAMIC, CHIP 0.1uF 25V (2012)
C101	1-163-251-11	s CERAMIC, CHIP 100pF 5% 50V (2012)
C102	1-163-038-00	s CERAMIC, CHIP 0.1uF 25V (2012)
C103	1-163-038-00	s CERAMIC, CHIP 0.1uF 25V (2012)
C104	1-163-038-00	s CERAMIC, CHIP 0.1uF 25V (2012)

\*a: BOARD No.suffix -11  
\*b: BOARD No.suffix -12

(IF-715 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
C105	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V (2012)
C106	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V (2012)
C107	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V (2012)
C108	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V (2012)
C109	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V (2012)
C110	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V (2012)
C111	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V (2012)
C200	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V (2012)
C201	1-163-251-11	s	CERAMIC, CHIP 100pF 5% 50V (2012)
C202	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V (2012)
C203	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V (2012)
C204	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V (2012)
C205	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V (2012)
C206	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V (2012)
C207	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V (2012)
C208	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V (2012)
C209	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V (2012)
C210	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V (2012)
C211	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V (2012)
C300	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V (2012)
C301	1-163-251-11	s	CERAMIC, CHIP 100pF 5% 50V (2012)
C302	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V (2012)
C303	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V (2012)
C304	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V (2012)
C305	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V (2012)
C306	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V (2012)
C307	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V (2012)
C308	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V (2012)
C310	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V (2012)
C311	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V (2012)
C400	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V (2012)
C401	1-163-251-11	s	CERAMIC, CHIP 100pF 5% 50V (2012)
C402	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V (2012)
C403	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V (2012)
C404	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V (2012)
C405	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V (2012)
C406	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V (2012)
C407	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V (2012)
C408	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V (2012)
C410	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V (2012)
C411	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V (2012)
CN1	1-778-249-11	o	CONNECTOR, 10P, MALE
CN2	1-564-011-11	o	CONNECTOR, 12P, MALE
CN3	1-560-357-11	o	CONNECTOR, IL-G 3P, MALE
CN4	1-560-357-11	o	CONNECTOR, IL-G 3P, MALE
CN5	1-560-357-11	o	CONNECTOR, IL-G 3P, MALE
CN6	1-560-357-11	o	CONNECTOR, IL-G 3P, MALE
CN7	1-560-357-11	o	CONNECTOR, IL-G 3P, MALE
CN8	1-560-357-11	o	CONNECTOR, IL-G 3P, MALE
CN9	1-564-011-11	o	CONNECTOR, 12P, MALE
CN10	1-506-473-11	s	CONNECTOR, 8P, MALE
CN11	1-778-249-11	o	CONNECTOR, 10P, MALE
CN12	1-580-541-11	s	CONNECTOR, LY 24P, MALE
CN13	1-560-356-00	o	CONNECTOR, IL-G 2P, MALE
CN21	1-778-249-11	o	CONNECTOR, 10P, MALE
CN22	1-580-542-11	o	CONNECTOR, LY 26P, MALE
CN23	1-560-356-00	o	CONNECTOR, IL-G 2P, MALE
CN31	1-778-249-11	o	CONNECTOR, 10P, MALE

(IF-715 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
CN32	1-580-543-11	o	CONNECTOR, LY 28P, MALE
CN33	1-560-356-00	o	CONNECTOR, IL-G 2P, MALE
CN41	1-778-249-11	o	CONNECTOR, 10P, MALE
CN42	1-580-544-11	s	CONNECTOR, LY 30P, MALE
CN43	1-560-356-00	o	CONNECTOR, IL-G 2P, MALE
CN101	*b 1-564-002-11	s	CONNECTOR, 3P, MALE
CN102	*b 1-564-002-11	s	CONNECTOR, 3P, MALE
D1	8-719-801-78	s	DIODE 1SS184
D2	8-719-801-78	s	DIODE 1SS184
D3	8-719-801-78	s	DIODE 1SS184
D5	8-719-801-78	s	DIODE 1SS184
D6	8-719-989-22	s	LED CL-150R-CD, RED
D7	8-719-801-78	s	DIODE 1SS184
D8	8-719-801-78	s	DIODE 1SS184
D9	8-719-801-78	s	DIODE 1SS184
D10	8-719-989-22	s	LED CL-150R-CD, RED
D11	8-719-104-34	s	DIODE 1S2835
D12	8-719-210-39	s	DIODE EC10QS04
D13	8-719-801-78	s	DIODE 1SS184
D14	8-719-989-22	s	LED CL-150R-CD, RED
D15	8-719-104-34	s	DIODE 1S2835
D16	8-719-801-78	s	DIODE 1SS184
D17	8-719-801-78	s	DIODE 1SS184
D101	8-719-104-34	s	DIODE 1S2835
D103	8-719-989-22	s	LED CL-150R-CD, RED
D104	8-719-104-34	s	DIODE 1S2835
D201	8-719-104-34	s	DIODE 1S2835
D203	8-719-989-22	s	LED CL-150R-CD, RED
D204	8-719-104-34	s	DIODE 1S2835
D301	8-719-104-34	s	DIODE 1S2835
D303	8-719-989-22	s	LED CL-150R-CD, RED
D304	8-719-104-34	s	DIODE 1S2835
D401	8-719-104-34	s	DIODE 1S2835
D403	8-719-989-22	s	LED CL-150R-CD, RED
D404	8-719-104-34	s	DIODE 1S2835
IC1	8-729-021-17	s	TRANSISTOR SI9947DY
IC2	8-759-927-46	s	IC SN74HC00ANS
IC3	8-759-925-85	s	IC SN74HC32ANS
IC4	8-759-926-07	s	IC SN74HC132ANS
IC5	8-759-925-73	s	IC SN74HC03NS
IC6	8-759-925-73	s	IC SN74HC03NS
IC7	8-759-927-99	s	IC MB3761PF
IC8	8-759-927-99	s	IC MB3761PF
IC9	8-759-925-85	s	IC SN74HC32ANS
IC10	8-759-925-80	s	IC SN74HC14ANS
IC11	8-759-064-41	s	IC S8081BF-S
IC12	8-759-062-66	s	IC TC7S66F
IC13	8-759-928-09	s	IC TLC27M2CPS
IC14	8-759-230-99	s	IC TC74HC4053AF
IC15	8-759-035-93	s	IC SC7S32F
IC16	8-759-925-85	s	IC SN74HC32ANS
IC17	8-759-387-75	s	IC TC7W00F
IC18	8-759-035-93	s	IC SC7S32F
IC100	8-759-928-09	s	IC TLC27M2CPS
IC101	8-759-925-85	s	IC SN74HC32ANS
IC102	8-759-242-78	s	IC TC7W02FU
IC103	8-759-035-93	s	IC SC7S32F
IC104	8-759-035-93	s	IC SC7S32F

\*a: BOARD No.suffix -11

\*b: BOARD No.suffix -12

(IF-715 BOARD)

Ref. No. or Q'ty	Part No.	SP Description
IC105	8-759-234-20	s IC TC7S08F
IC200	8-759-928-09	s IC TLC27M2CPS
IC201	8-759-925-85	s IC SN74HC32ANS
IC202	8-759-242-78	s IC TC7W02FU
IC203	8-759-035-93	s IC SC7S32F
IC204	8-759-035-93	s IC SC7S32F
IC205	8-759-234-20	s IC TC7S08F
IC300	8-759-928-09	s IC TLC27M2CPS
IC301	8-759-925-85	s IC SN74HC32ANS
IC302	8-759-242-78	s IC TC7W02FU
IC303	8-759-035-93	s IC SC7S32F
IC304	8-759-035-93	s IC SC7S32F
IC400	8-759-928-09	s IC TLC27M2CPS
IC401	8-759-925-85	s IC SN74HC32ANS
IC402	8-759-242-78	s IC TC7W02FU
IC403	8-759-035-93	s IC SC7S32F
IC404	8-759-035-93	s IC SC7S32F
L1	1-406-864-21	s COIL, CHOKe 4.7uH
PS1	△ 1-533-266-11	s FUSE, CHIP 3.15A 125V
PS2	△ 1-533-266-11	s FUSE, CHIP 3.15A 125V
Q1	*b 8-729-027-59	s TRANSISTOR DTC144EKA
Q2	8-729-027-59	s TRANSISTOR DTC144EKA
Q3	*b 8-729-027-59	s TRANSISTOR DTC144EKA
Q4	8-729-027-59	s TRANSISTOR DTC144EKA
Q5	8-729-027-59	s TRANSISTOR DTC144EKA
Q6	8-729-027-59	s TRANSISTOR DTC144EKA
Q7	8-729-027-59	s TRANSISTOR DTC144EKA
Q8	8-729-027-59	s TRANSISTOR DTC144EKA
Q9	8-729-027-59	s TRANSISTOR DTC144EKA
Q10	8-729-027-59	s TRANSISTOR DTC144EKA
Q11	8-729-027-59	s TRANSISTOR DTC144EKA
Q12	8-729-117-32	s TRANSISTOR 2SC4177-L6
Q13	8-729-027-59	s TRANSISTOR DTC144EKA
Q14	8-729-027-59	s TRANSISTOR DTC144EKA
Q15	8-729-027-59	s TRANSISTOR DTC144EKA
Q16	8-729-027-59	s TRANSISTOR DTC144EKA
Q17	8-729-027-59	s TRANSISTOR DTC144EKA
Q18	8-729-027-59	s TRANSISTOR DTC144EKA
Q100	8-729-027-59	s TRANSISTOR DTC144EKA
Q101	8-729-027-59	s TRANSISTOR DTC144EKA
Q102	8-729-027-59	s TRANSISTOR DTC144EKA
Q200	8-729-027-59	s TRANSISTOR DTC144EKA
Q201	8-729-027-59	s TRANSISTOR DTC144EKA
Q202	8-729-027-59	s TRANSISTOR DTC144EKA
Q300	8-729-027-59	s TRANSISTOR DTC144EKA
Q301	8-729-027-59	s TRANSISTOR DTC144EKA
Q302	8-729-027-59	s TRANSISTOR DTC144EKA
Q303	8-729-027-59	s TRANSISTOR DTC144EKA
Q400	8-729-027-59	s TRANSISTOR DTC144EKA
Q401	8-729-027-59	s TRANSISTOR DTC144EKA
Q402	8-729-027-59	s TRANSISTOR DTC144EKA
Q403	8-729-027-59	s TRANSISTOR DTC144EKA
R1	1-216-662-11	s METAL, CHIP 3.0K 0.5% 1/10W (2012)
R2	1-216-658-11	s METAL, CHIP 2.0K 0.5% 1/10W (2012)
R3	1-216-037-00	s METAL, CHIP 330 5% 1/10W (2012)
R4	1-216-089-00	s METAL, CHIP 47K 5% 1/10W (2012)
R5	1-216-089-00	s METAL, CHIP 47K 5% 1/10W (2012)

(IF-715 BOARD)

Ref. No. or Q'ty	Part No.	SP Description
R6	1-216-001-00	s METAL, CHIP 10 5% 1/10W (2012)
R7	*b 1-216-093-00	s METAL, CHIP 68K 5% 1/10W (2012)
R8	1-216-065-00	s METAL, CHIP 4.7K 5% 1/10W (2012)
R9	1-216-093-00	s METAL, CHIP 68K 5% 1/10W (2012)
R10	1-216-093-00	s METAL, CHIP 68K 5% 1/10W (2012)
R11	1-216-093-00	s METAL, CHIP 68K 5% 1/10W (2012)
R12	1-216-093-00	s METAL, CHIP 68K 5% 1/10W (2012)
R13	1-216-093-00	s METAL, CHIP 68K 5% 1/10W (2012)
R14	1-216-093-00	s METAL, CHIP 68K 5% 1/10W (2012)
R15	1-216-073-00	s METAL, CHIP 10K 5% 1/10W (2012)
R16	1-216-101-00	s METAL, CHIP 150K 5% 1/10W (2012)
R17	1-216-105-11	s METAL, CHIP 220K 5% 1/10W (2012)
R18	1-216-081-00	s METAL, CHIP 22K 5% 1/10W (2012)
R19	1-216-097-00	s METAL, CHIP 100K 5% 1/10W (2012)
R20	1-216-097-00	s METAL, CHIP 100K 5% 1/10W (2012)
R21	1-216-097-00	s METAL, CHIP 100K 5% 1/10W (2012)
R22	1-216-057-00	s METAL, CHIP 2.2K 5% 1/10W (2012)
R23	1-216-069-00	s METAL, CHIP 6.8K 5% 1/10W (2012)
R24	1-216-105-11	s METAL, CHIP 220K 5% 1/10W (2012)
R26	1-216-065-00	s METAL, CHIP 4.7K 5% 1/10W (2012)
R27	1-216-045-00	s METAL, CHIP 680 5% 1/10W (2012)
R28	1-216-073-00	s METAL, CHIP 10K 5% 1/10W (2012)
R30	1-216-105-11	s METAL, CHIP 220K 5% 1/10W (2012)
R31	1-216-105-11	s METAL, CHIP 220K 5% 1/10W (2012)
R32	1-216-049-00	s METAL, CHIP 1.0K 5% 1/10W (2012)
R33	1-216-089-00	s METAL, CHIP 47K 5% 1/10W (2012)
R34	1-216-089-00	s METAL, CHIP 47K 5% 1/10W (2012)
R35	1-216-097-00	s METAL, CHIP 100K 5% 1/10W (2012)
R36	1-216-097-00	s METAL, CHIP 100K 5% 1/10W (2012)
R37	1-216-073-00	s METAL, CHIP 10K 5% 1/10W (2012)
R38	1-216-045-00	s METAL, CHIP 680 5% 1/10W (2012)
R39	1-216-045-00	s METAL, CHIP 680 5% 1/10W (2012)
R40	1-216-073-00	s METAL, CHIP 10K 5% 1/10W (2012)
R41	1-216-073-00	s METAL, CHIP 10K 5% 1/10W (2012)
R42	1-216-073-00	s METAL, CHIP 10K 5% 1/10W (2012)
R43	1-216-105-11	s METAL, CHIP 220K 5% 1/10W (2012)
R44	1-216-105-11	s METAL, CHIP 220K 5% 1/10W (2012)
R45	1-216-033-00	s METAL, CHIP 220 5% 1/10W (2012)
R46	1-216-009-00	s METAL, CHIP 22 5% 1/10W (2012)
R47	1-216-009-00	s METAL, CHIP 22 5% 1/10W (2012)
R48	1-216-009-00	s METAL, CHIP 22 5% 1/10W (2012)
R49	1-216-009-00	s METAL, CHIP 22 5% 1/10W (2012)
R50	1-216-009-00	s METAL, CHIP 22 5% 1/10W (2012)
R51	1-216-009-00	s METAL, CHIP 22 5% 1/10W (2012)
R52	1-216-009-00	s METAL, CHIP 22 5% 1/10W (2012)
R53	1-216-009-00	s METAL, CHIP 22 5% 1/10W (2012)
R54	1-216-009-00	s METAL, CHIP 22 5% 1/10W (2012)
R55	1-216-009-00	s METAL, CHIP 22 5% 1/10W (2012)
R56	1-216-009-00	s METAL, CHIP 22 5% 1/10W (2012)
R57	1-216-009-00	s METAL, CHIP 22 5% 1/10W (2012)
R58	1-216-009-00	s METAL, CHIP 22 5% 1/10W (2012)
R59	1-216-009-00	s METAL, CHIP 22 5% 1/10W (2012)
R60	1-216-009-00	s METAL, CHIP 22 5% 1/10W (2012)
R61	1-216-009-00	s METAL, CHIP 22 5% 1/10W (2012)
R62	1-216-009-00	s METAL, CHIP 22 5% 1/10W (2012)
R63	1-216-009-00	s METAL, CHIP 22 5% 1/10W (2012)
R64	1-216-009-00	s METAL, CHIP 22 5% 1/10W (2012)
R65	1-216-049-00	s METAL, CHIP 1.0K 5% 1/10W (2012)
R66	1-216-073-00	s METAL, CHIP 10K 5% 1/10W (2012)

\*b: BOARD No.suffix -12

## (IF-715 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
R67	1-216-049-00	s	METAL, CHIP 1.0K 5% 1/10W (2012)
R68	1-216-049-00	s	METAL, CHIP 1.0K 5% 1/10W (2012)
R69	1-216-089-00	s	METAL, CHIP 47K 5% 1/10W (2012)
R71	1-216-089-00	s	METAL, CHIP 47K 5% 1/10W (2012)
R72	1-216-037-00	s	METAL, CHIP 330 5% 1/10W (2012)
R73	1-216-089-00	s	METAL, CHIP 47K 5% 1/10W (2012)
R74	1-216-295-00	s	METAL, CHIP 0 (2012)
R75	1-216-097-00	s	METAL, CHIP 100K 5% 1/10W (2012)
R76	1-216-009-00	s	METAL, CHIP 22 5% 1/10W (2012)
R77	1-216-065-00	s	METAL, CHIP 4.7K 5% 1/10W (2012)
R78	1-216-073-00	s	METAL, CHIP 10K 5% 1/10W (2012)
R79	*b 1-216-037-00	s	METAL, CHIP 330 5% 1/10W (2012)
	*a 1-249-411-11	s	CARBON 330 5% 1/4W
R80	*b 1-216-093-00	s	METAL, CHIP 68K 5% 1/10W (2012)
R100	1-216-121-00	s	METAL, CHIP 1.0M 5% 1/10W (2012)
R101	1-216-025-00	s	METAL, CHIP 100 5% 1/10W (2012)
R102	1-216-049-00	s	METAL, CHIP 1.0K 5% 1/10W (2012)
R103	1-216-073-00	s	METAL, CHIP 10K 5% 1/10W (2012)
R104	1-216-073-00	s	METAL, CHIP 10K 5% 1/10W (2012)
R106	1-216-045-00	s	METAL, CHIP 680 5% 1/10W (2012)
R107	1-216-073-00	s	METAL, CHIP 10K 5% 1/10W (2012)
R109	1-216-121-00	s	METAL, CHIP 1.0M 5% 1/10W (2012)
R110	1-216-121-00	s	METAL, CHIP 1.0M 5% 1/10W (2012)
R200	1-216-121-00	s	METAL, CHIP 1.0M 5% 1/10W (2012)
R201	1-216-025-00	s	METAL, CHIP 100 5% 1/10W (2012)
R202	1-216-049-00	s	METAL, CHIP 1.0K 5% 1/10W (2012)
R203	1-216-073-00	s	METAL, CHIP 10K 5% 1/10W (2012)
R204	1-216-073-00	s	METAL, CHIP 10K 5% 1/10W (2012)
R206	1-216-045-00	s	METAL, CHIP 680 5% 1/10W (2012)
R207	1-216-073-00	s	METAL, CHIP 10K 5% 1/10W (2012)
R209	1-216-121-00	s	METAL, CHIP 1.0M 5% 1/10W (2012)
R210	1-216-121-00	s	METAL, CHIP 1.0M 5% 1/10W (2012)
R300	1-216-121-00	s	METAL, CHIP 1.0M 5% 1/10W (2012)
R301	1-216-025-00	s	METAL, CHIP 100 5% 1/10W (2012)
R302	1-216-049-00	s	METAL, CHIP 1.0K 5% 1/10W (2012)
R303	1-216-073-00	s	METAL, CHIP 10K 5% 1/10W (2012)
R304	1-216-073-00	s	METAL, CHIP 10K 5% 1/10W (2012)
R306	1-216-045-00	s	METAL, CHIP 680 5% 1/10W (2012)
R307	1-216-073-00	s	METAL, CHIP 10K 5% 1/10W (2012)
R308	1-216-073-00	s	METAL, CHIP 10K 5% 1/10W (2012)
R309	1-216-121-00	s	METAL, CHIP 1.0M 5% 1/10W (2012)
R310	1-216-121-00	s	METAL, CHIP 1.0M 5% 1/10W (2012)
R400	1-216-121-00	s	METAL, CHIP 1.0M 5% 1/10W (2012)
R401	1-216-025-00	s	METAL, CHIP 100 5% 1/10W (2012)
R402	1-216-049-00	s	METAL, CHIP 1.0K 5% 1/10W (2012)
R403	1-216-073-00	s	METAL, CHIP 10K 5% 1/10W (2012)
R404	1-216-073-00	s	METAL, CHIP 10K 5% 1/10W (2012)
R406	1-216-045-00	s	METAL, CHIP 680 5% 1/10W (2012)
R407	1-216-073-00	s	METAL, CHIP 10K 5% 1/10W (2012)
R408	1-216-073-00	s	METAL, CHIP 10K 5% 1/10W (2012)
R409	1-216-121-00	s	METAL, CHIP 1.0M 5% 1/10W (2012)
R410	1-216-121-00	s	METAL, CHIP 1.0M 5% 1/10W (2012)
S1	1-572-474-11	s	SWITCH, PUSH
S3	1-572-474-11	s	SWITCH, PUSH
S4	1-572-474-11	s	SWITCH, PUSH
S5	1-692-271-31	s	SWITCH, DIP 8-CKT

\*a: BOARD No.suffix -11

\*b: BOARD No.suffix -12

## SE-378 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	A-8312-119-A	o	MOUNTED CIRCUIT BOARD, SE-378
2pcs	1-560-372-00	o	CONTACT, IL-G, FEMALE, AWG22-28
1pcs	1-561-514-00	o	HOUSING, IL-G 2P
C1	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V (2012)
C3	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V (2012)
C4	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V (2012)
C5	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V (2012)
C6	1-163-037-11	s	CERAMIC, CHIP 0.022uF 10% 25V(2012)
C7	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V (2012)
C8	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V (2012)
C9	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V (2012)
C10	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V (2012)
CN1	1-691-551-11	s	CONNECTOR, 8P, MALE
F1	△ 1-533-351-11	s	FUSE, CHIP 2A 125V
F2	△ 1-533-251-11	s	FUSE, THERMAL 115-DEG-C 3A 250V
F3	△ 1-533-351-11	s	FUSE, CHIP 2A 125V
F4	△ 1-533-251-11	s	FUSE, THERMAL 115-DEG-C 3A 250V
IC1	8-759-460-95	s	IC AD22100KR-REEL
IC2	8-759-440-71	s	IC NJM2119M
IC3	8-759-460-95	s	IC AD22100KR-REEL
IC4	8-759-440-71	s	IC NJM2119M
Q1	8-729-117-32	s	TRANSISTOR 2SC4177-L6
Q2	8-729-117-32	s	TRANSISTOR 2SC4177-L6
Q3	8-729-140-63	s	TRANSISTOR 2SA1611-M5M6
Q4	8-729-142-68	s	TRANSISTOR 2SJ143
Q5	8-729-140-63	s	TRANSISTOR 2SA1611-M5M6
Q6	8-729-142-68	s	TRANSISTOR 2SJ143
Q7	8-729-140-63	s	TRANSISTOR 2SA1611-M5M6
Q8	8-729-142-68	s	TRANSISTOR 2SJ143
Q9	8-729-140-63	s	TRANSISTOR 2SA1611-M5M6
Q10	8-729-142-68	s	TRANSISTOR 2SJ143
Q11	8-729-140-63	s	TRANSISTOR 2SA1611-M5M6
Q12	8-729-142-68	s	TRANSISTOR 2SJ143
Q13	8-729-140-63	s	TRANSISTOR 2SA1611-M5M6
Q14	8-729-142-68	s	TRANSISTOR 2SJ143
R1	1-216-659-11	s	METAL, CHIP 2.2K 0.5% 1/10W (2012)
R2	1-216-628-11	s	METAL, CHIP 110 0.5% 1/10W (2012)
R3	1-216-649-11	s	METAL, CHIP 820 0.5% 1/10W (2012)
R5	1-216-675-11	s	METAL, CHIP 10K 0.5% 1/10W (2012)
R9	1-216-627-11	s	METAL, CHIP 100 0.5% 1/10W (2012)
R10	1-216-687-11	s	METAL, CHIP 33K 0.5% 1/10W (2012)
R11	1-216-659-11	s	METAL, CHIP 2.2K 0.5% 1/10W (2012)
R12	1-216-628-11	s	METAL, CHIP 110 0.5% 1/10W (2012)
R13	1-216-649-11	s	METAL, CHIP 820 0.5% 1/10W (2012)
R15	1-216-675-11	s	METAL, CHIP 10K 0.5% 1/10W (2012)
R19	1-216-627-11	s	METAL, CHIP 100 0.5% 1/10W (2012)
R20	1-216-627-11	s	METAL, CHIP 100 0.5% 1/10W (2012)
R21	1-216-675-11	s	METAL, CHIP 10K 0.5% 1/10W (2012)
R22	1-216-675-11	s	METAL, CHIP 10K 0.5% 1/10W (2012)
R23	1-216-675-11	s	METAL, CHIP 10K 0.5% 1/10W (2012)
R24	1-216-675-11	s	METAL, CHIP 10K 0.5% 1/10W (2012)
R25	1-216-675-11	s	METAL, CHIP 10K 0.5% 1/10W (2012)
R26	1-216-679-11	s	METAL, CHIP 15K 0.5% 1/10W (2012)
R27	1-220-246-11	s	METAL, CHIP 1.5 10% 1/2W (4532)
R28	1-216-679-11	s	METAL, CHIP 15K 0.5% 1/10W (2012)
R29	1-220-246-11	s	METAL, CHIP 1.5 10% 1/2W (4532)
R30	1-216-679-11	s	METAL, CHIP 15K 0.5% 1/10W (2012)

### 3-3. Packing Materials and Supplied Accessories List

(SE-378 BOARD)

Ref. No. or Q'ty	Part No.	SP Description
R31	1-220-246-11	s METAL, CHIP 1.5 10% 1/2W (4532)
R32	1-216-679-11	s METAL, CHIP 15K 0.5% 1/10W (2012)
R33	1-220-246-11	s METAL, CHIP 1.5 10% 1/2W (4532)
R34	1-216-679-11	s METAL, CHIP 15K 0.5% 1/10W (2012)
R35	1-220-246-11	s METAL, CHIP 1.5 10% 1/2W (4532)
R36	1-216-679-11	s METAL, CHIP 15K 0.5% 1/10W (2012)
R37	1-220-246-11	s METAL, CHIP 1.5 10% 1/2W (4532)
R38	1-218-231-11	s METAL, CHIP 1.0 10% 1/2W (4532)
R39	1-218-231-11	s METAL, CHIP 1.0 10% 1/2W (4532)
R40	1-218-231-11	s METAL, CHIP 1.0 10% 1/2W (4532)
R41	1-218-231-11	s METAL, CHIP 1.0 10% 1/2W (4532)
R42	1-218-231-11	s METAL, CHIP 1.0 10% 1/2W (4532)
R43	1-218-231-11	s METAL, CHIP 1.0 10% 1/2W (4532)
R44	1-218-231-11	s METAL, CHIP 1.0 10% 1/2W (4532)
R45	1-218-231-11	s METAL, CHIP 1.0 10% 1/2W (4532)
R46	1-218-231-11	s METAL, CHIP 1.0 10% 1/2W (4532)
R47	1-218-231-11	s METAL, CHIP 1.0 10% 1/2W (4532)
R48	1-216-675-11	s METAL, CHIP 10K 0.5% 1/10W (2012)
R49	1-216-675-11	s METAL, CHIP 10K 0.5% 1/10W (2012)
R50	1-216-627-11	s METAL, CHIP 100 0.5% 1/10W (2012)
TH1	1-807-796-11	s THERMISTOR S-10K
TH2	1-807-796-11	s THERMISTOR S-10K
TH3	1-807-796-11	s THERMISTOR S-10K
TH4	1-807-796-11	s THERMISTOR S-10K
TH5	1-807-796-11	s THERMISTOR S-10K
TH6	1-807-796-11	s THERMISTOR S-10K

Ref. No. or Q'ty	Part No.	SP Description
2pcs	1-543-947-11	s CORE, FERRITE
1pc	△ 1-750-686-11	s CONNECTOR, CONVERSION (3P-2P) For J model only
1pc	1-769-670-31	o CABLE, DISK ARRAY, SCSI
1pc	△ 1-776-997-11	s CORD SET, POWER For J model only
1pc	3-200-082-01	o INDIVIDUAL CARTON
2pcs	3-200-083-01	o CUSHION
1pc	3-613-640-01	o PLUG, HOLDER C For J model only
1pc	3-704-355-01	o SHEET (STANDARD), PROTECTION

### 3-4. Optional Fixtures List

Part No.	SP Description
J-6323-430-A	o TORQUE DRIVER'S BIT (+3 mm, l=90 mm)
J-6523-060-A	o HDD CUSHION
J-6530-070-A	o SHOCKLESS TORQUE SCREWDRIVER 1.2 N•m (12 kgf•cm)





## Section 4

### Semiconductor Pin Assignments

ここに記載されている半導体は、それぞれの機能を等価的に表したものです。なお、互換性のない型名を併記していることがありますので、部品を交換するときは、Spare Partsの章を参照してください。

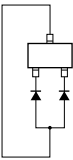
等価回路はICメーカーのデータブックに従いました。

Semiconductors of which functions are equivalent are described here. For parts replacement, refer to the section of Spare Parts in this manual. The circuit diagram of each IC is obtained from the IC data book published by the manufacturer.

DIODE	Page	LED	Page	TRANSISTOR	Page	IC	Page
1S2835-T1 .....	4-2	CL-150R-CD .....	4-2	2SA1175-FEK .....	4-2	AD22100KR-REEL .....	4-3
1S2836 .....	4-2	CL-150R-CD-T .....	4-2	2SA1611-M5M6 .....	4-2	AN1431T .....	4-3
1S2837-T1 .....	4-2			2SA1611T1-M5M6 .....	4-2		
1SS120 .....	4-2	SLP281C-51 .....	4-2	2SC1623 .....	4-2	HA17431PA .....	4-3
1SS184 .....	4-2			2SC1623-T1-L5L6 .....	4-2	MB3761PF .....	4-3
		TLG123A .....	4-2	2SC2785-FEK .....	4-2	MB3761PF-ER .....	4-3
AG01Z .....	4-2	TLR123 .....	4-2	2SC4177-L6 .....	4-2	MB3761PF-T2 .....	4-3
		TLY123 .....	4-2	2SC4177-T1L5L6 .....	4-2	MC74HC4053F .....	4-4
D10XB60 .....	4-2			2SJ143 .....	4-2		
D24ESB .....	4-2			2SK1572S .....	4-2	NJM2119M(TE1) .....	4-3
				2SK2698 .....	4-2		
EC10QS-04 .....	4-2					S8081BF-S .....	4-4
EC10QS04-TE12L5 .....	4-2			DTA144EKA-T146 .....	4-3	S8081BF-TF .....	4-4
EG01C .....	4-2			DTC114ESA .....	4-3	SC7S32F .....	4-4
EG01CV0 .....	4-2			DTC144EKA-T146 .....	4-3	SN74HC00ANS .....	4-4
ESAD83M-006 .....	4-2					SN74HC00ANS-E05 .....	4-4
ESAD92M-02 .....	4-2			IRFIBC20 .....	4-2	SN74HC03NS .....	4-4
				IRFP450 .....	4-3	SN74HC03NS-E05 .....	4-4
GMA01 .....	4-2					SN74HC132ANS .....	4-4
GMA01-BT .....	4-2			SI4953DY .....	4-3	SN74HC132ANS-E05 .....	4-4
GMB01-AT1 .....	4-2			SI4953DY-T1 .....	4-3	SN74HC14ANS .....	4-5
				SI9947DY-T1 .....	4-3	SN74HC14ANS-E05 .....	4-5
HFA15TB60 .....	4-2					SN74HC32ANS .....	4-5
HZM10NB .....	4-2					SN74HC32ANS-E05 .....	4-5
HZM5.6NBT1 .....	4-2						
HZM5.6NBTL .....	4-2			<b>OTHERS</b>	<b>Page</b>	TC74HC4053AF .....	4-4
HZS13NB1 .....	4-2					TC74HC4053AF(EL) .....	4-4
HZS16NB1 .....	4-2			PC123F .....	4-3	TC74HC4053AF-TP2 .....	4-4
HZS24NB1 .....	4-2					TC7S08F .....	4-5
HZS5.1NB1 .....	4-2					TC7S08F(TE85R) .....	4-5
						TC7S32F(TE85R) .....	4-4
MTZJ-T-77-5.6B .....	4-2					TC7S66F .....	4-5
						TC7S66F(TE85R) .....	4-5
RD10MB .....	4-2					TC7W00F(TE12R) .....	4-5
RD16ESB .....	4-2					TC7W02F .....	4-5
RD24ESB .....	4-2					TC7W02F(TE12R) .....	4-5
RD5.1ES-B2 .....	4-2					TLC27M2CPS .....	4-5
RD5.1ESB .....	4-2					TLC27M2CPS-E05 .....	4-5
RD5.6MB .....	4-2						

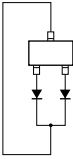
DIODE

—TOP VIEW—

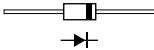


1S2835-T1  
1S2836

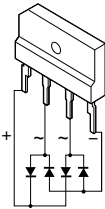
—TOP VIEW—



1S2837-T1  
1SS184



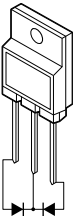
1SS120  
AG01Z  
EG01C  
EG01CV0  
GMA01  
GMA01-BT  
GMB01-AT1



D10XB60

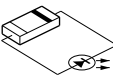


EC10QS-04  
EC10QS04-TE12L5

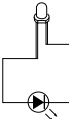


ESAD83M-006

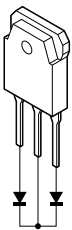
LED



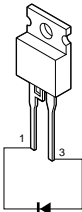
CL-150R-CD  
CL-150R-CD-T



SLP281C-51  
TLG123A  
TLR123  
TLY123



ESAD92M-02

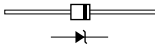


HFA15TB60

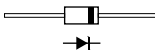
—TOP VIEW—



HZM10NB  
HZM5.6NBT1  
HZM5.6NBTL  
RD10MB  
RD5.6MB

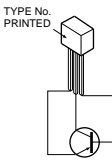


HZS13NB1  
HZS16NB1



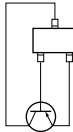
D24ESB  
HZS24NB1  
HZS5.1NB1  
MTZJ-T-77-5.6B  
RD16ESB  
RD24ESB  
RD5.1ES-B2  
RD5.1ESB

TRANSISTOR



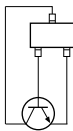
2SA1175-FEK

—TOP VIEW—

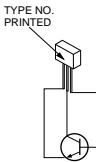


2SA1611-M5M6  
2SA1611T1-M5M6

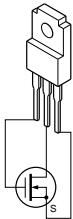
—TOP VIEW—



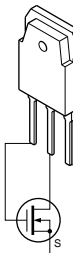
2SC1623  
2SC1623-T1-L5L6  
2SC4177-L6  
2SC4177-T1L5L6



2SC2785-FEK



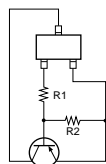
2SJ143  
2SK1572S  
IRFIBC20



2SK2698

## OTHERS

—TOP VIEW—

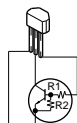
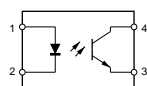


DTA144EKA-T146  
(R1, R2=47 K)

—TOP VIEW—

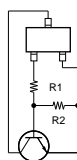


PC123F

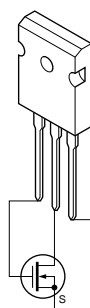


DTC114ESA  
(R1, R2=10 K)

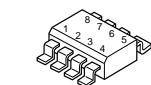
—TOP VIEW—



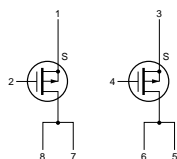
DTC144EKA-T146  
(R1, R2=47 K)



IRFP450



SI4953DY  
SI4953DY-T1  
SI9947DY-T1

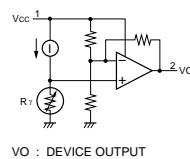
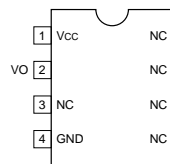


## IC

### AD22100KR-REEL (ANALOG DEVICES)

#### VOLTAGE OUTPUT TEMPERATURE SENSOR

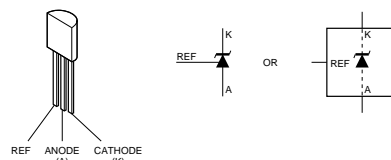
—TOP VIEW—



VO : DEVICE OUTPUT

### AN1431T (MATSUSHITA) HA17431PA

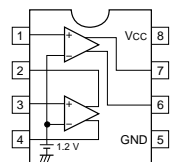
#### ADJUSTABLE PRECISION SHUNT REGULATOR



### MB3761PF (FUJITSU) MB3761PF-ER (FUJITSU) MB3761PF-T2

#### VOLTAGE DETECTOR

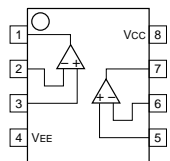
—TOP VIEW—



### NJM2119M(Te1) (JRC)

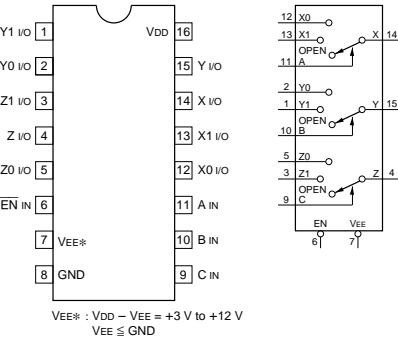
#### DUAL OPERATIONAL AMPLIFIERS (SINGLE-SUPPLY TYPE)

—TOP VIEW—



MC74HC4053F (MOTOROLA)  
TC74HC4053AF (TOSHIBA)  
TC74HC4053AF(EL)  
TC74HC4053AF-TP2

C-MOS TRIPLE 2-CHANNEL ANALOG MULTIPLEXER/DEMULTIPLEXER  
—TOP VIEW—

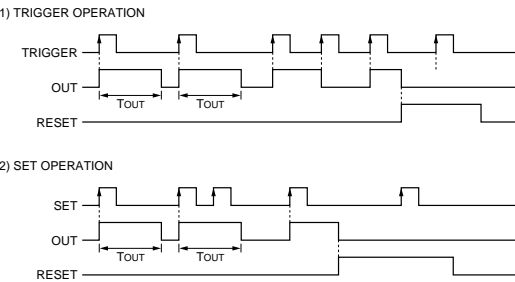
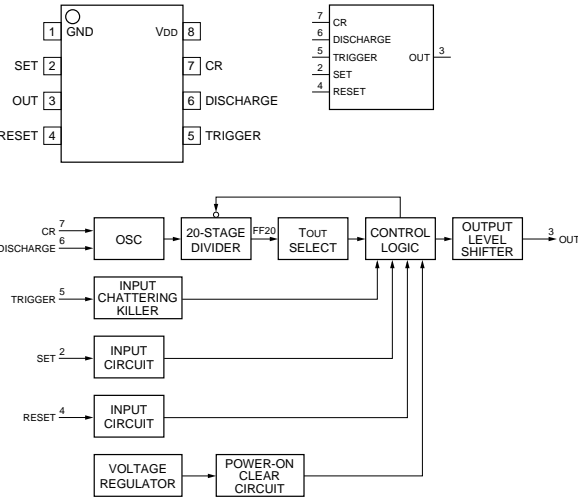


CONTROL INPUTS				ON CHANNEL		
EN	C	B	A			
0	0	0	0	Z0	Y0	X0
0	0	0	1	Z0	Y0	X1
0	0	1	0	Z0	Y1	X0
0	0	1	1	Z0	Y1	X1
0	1	0	0	Z1	Y0	X0
0	1	0	1	Z1	Y0	X1
0	1	1	0	Z1	Y1	X0
0	1	1	1	Z1	Y1	X1
1	x	x	x	OPEN		

0 : LOW LEVEL  
1 : HIGH LEVEL  
x : DON'T CARE

S8081BF-S (SEIKO I&E)  
S8081BF-TF

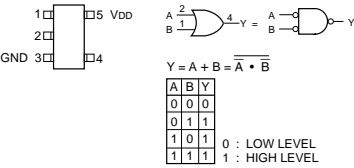
C-MOS CR TIMER  
—TOP VIEW—



$TOUT = TOSC \times 2^{19}$   
 $TOSC = 1.45 \times RT \times CT$

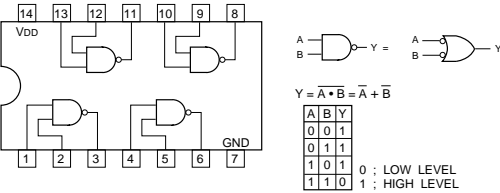
SC7S32F (MOTOROLA)CHIP PACKAGE  
TC7S32F(TE85R)

C-MOS 2-INPUT OR GATE  
—TOP VIEW—



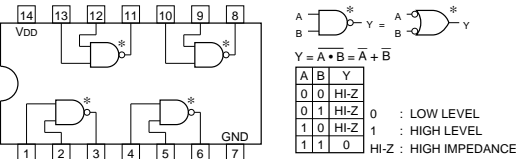
SN74HC00ANS (TI)  
SN74HC00ANS-E05

C-MOS QUAD 2-INPUT NAND GATES  
—TOP VIEW—



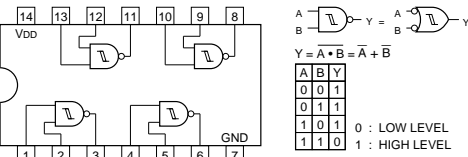
SN74HC03NS (TI)  
SN74HC03NS-E05

C-MOS QUAD 2-INPUT POSITIVE-NAND GATE WITH OPEN-DRAIN  
—TOP VIEW—



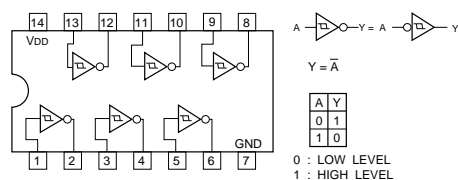
SN74HC132ANS (TI)  
SN74HC132ANS-E05

C-MOS QUAD 2-INPUT NAND SCHMITT TRIGGER  
—TOP VIEW—

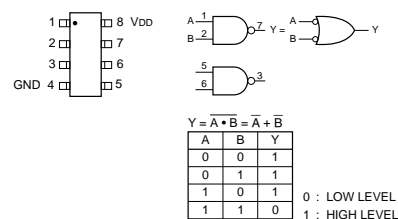


**SN74HC14ANS (TI)**  
**SN74HC14ANS-E05**
**C-MOS HEX SCHMITT TRIGGER INVERTERS**

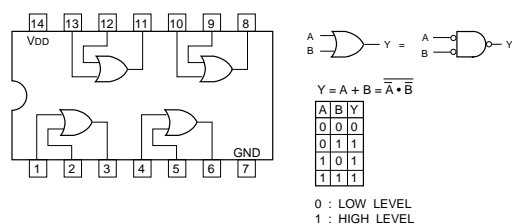
—TOP VIEW—


**TC7W00F(TE12R) (TOSHIBA)**
**C-MOS DUAL 2-INPUT NAND GATE**

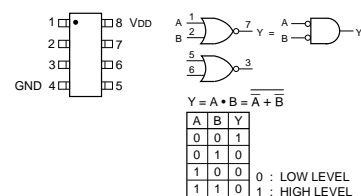
—TOP VIEW—


**SN74HC32ANS (TI)**  
**SN74HC32ANS-E05**
**C-MOS QUAD 2-INPUT OR GATES**

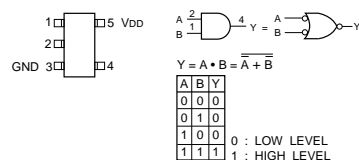
—TOP VIEW—


**TC7W02F (TOSHIBA)**  
**TC7W02F(TE12R)**
**C-MOS DUAL 2-INPUT NOR GATE**

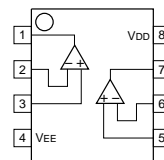
—TOP VIEW—


**TC7S08F (TOSHIBA)**  
**TC7S08F(TE85R)**
**C-MOS 2-INPUT AND GATE**

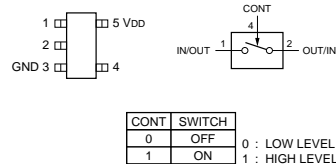
—TOP VIEW—


**TLC27M2CPS (TI)**  
**TLC27M2CPS-E05**
**C-MOS DUAL OPERATIONAL AMPLIFIERS (SINGLE-SUPPLY TYPE)**

—TOP VIEW—

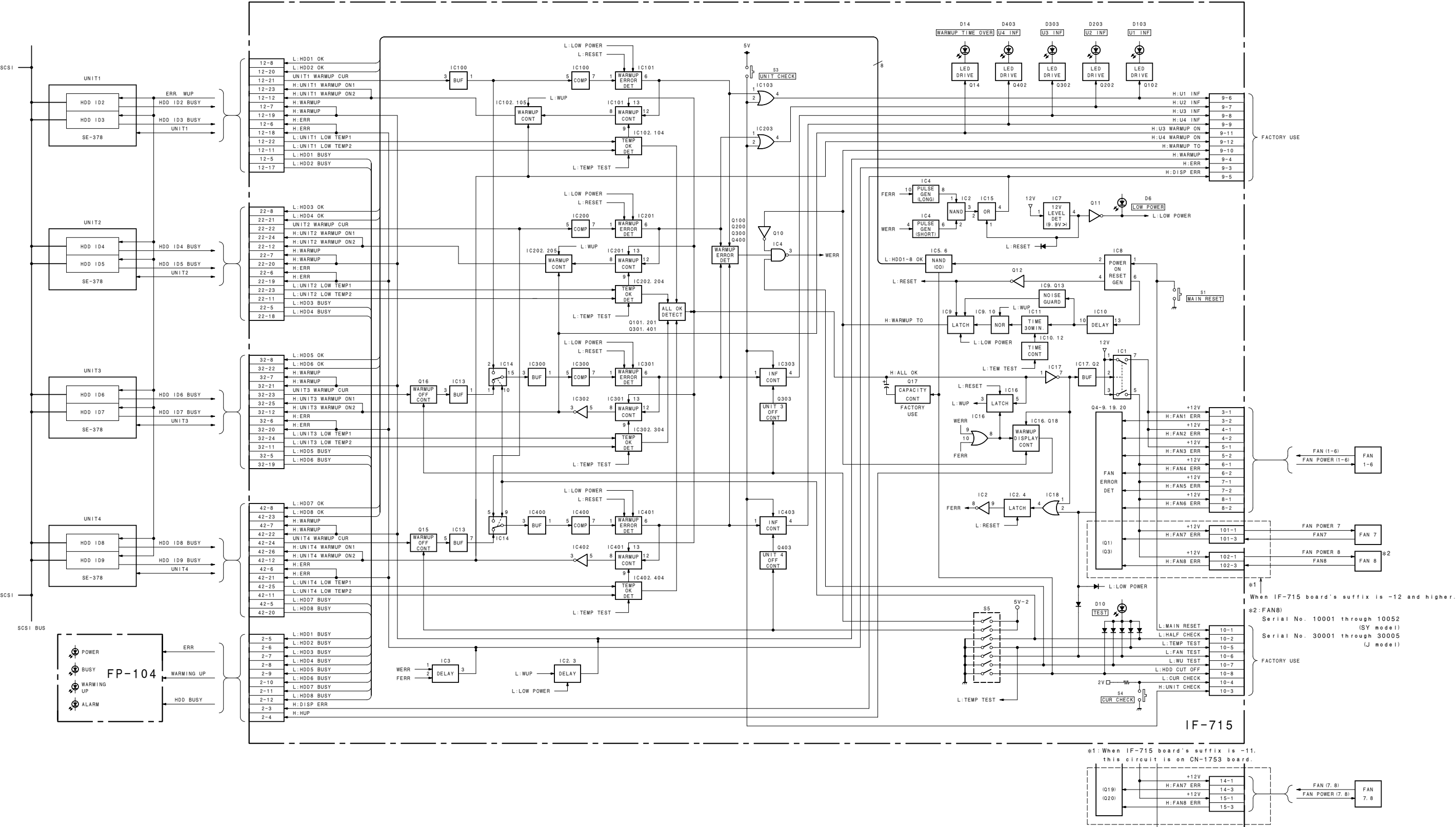

**TC7S66F (TOSHIBA)**  
**TC7S66F(TE85R)**
**C-MOS BILATERAL ANALOG SWITCH**

—TOP VIEW—





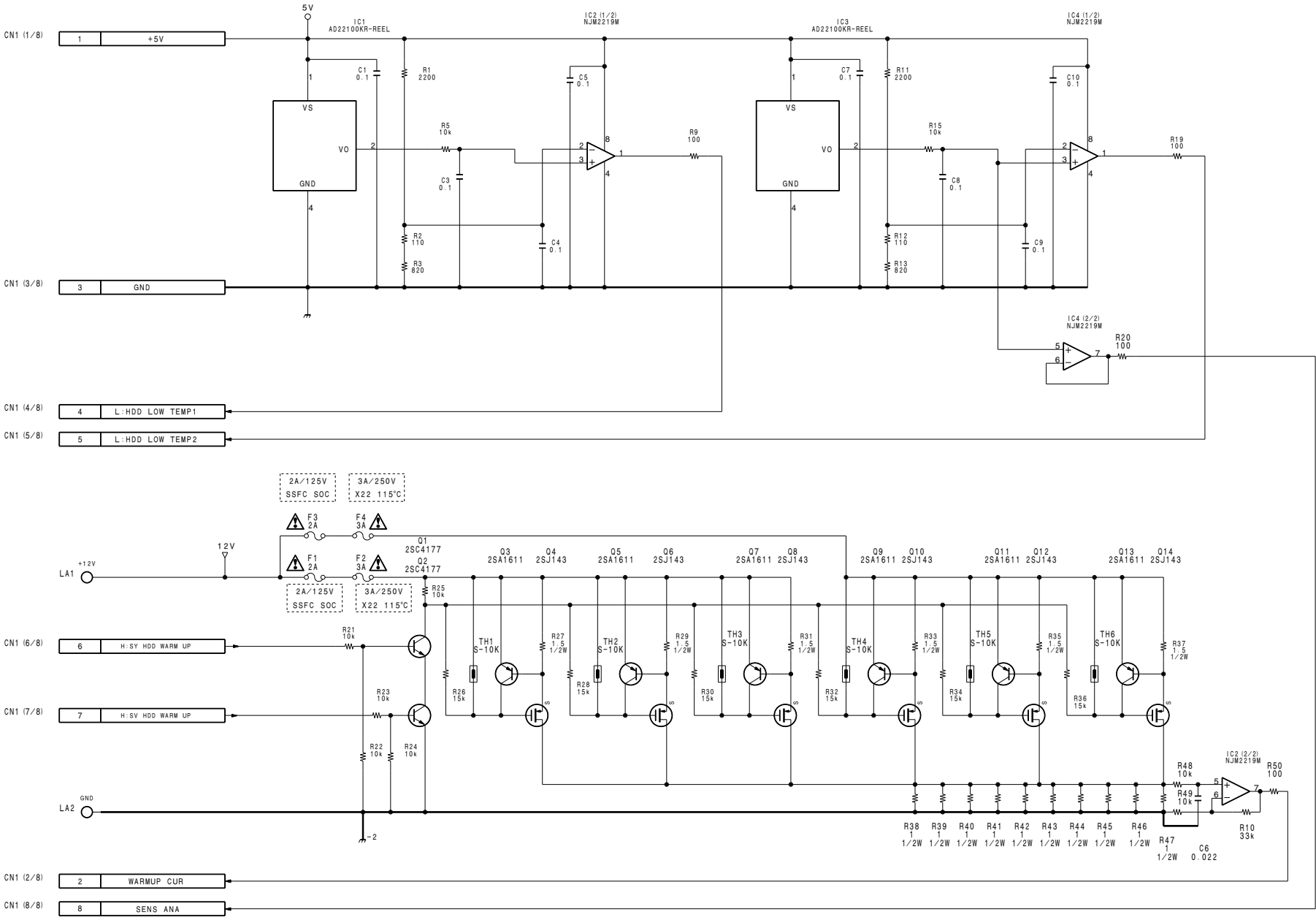
Section 5  
Block Diagram



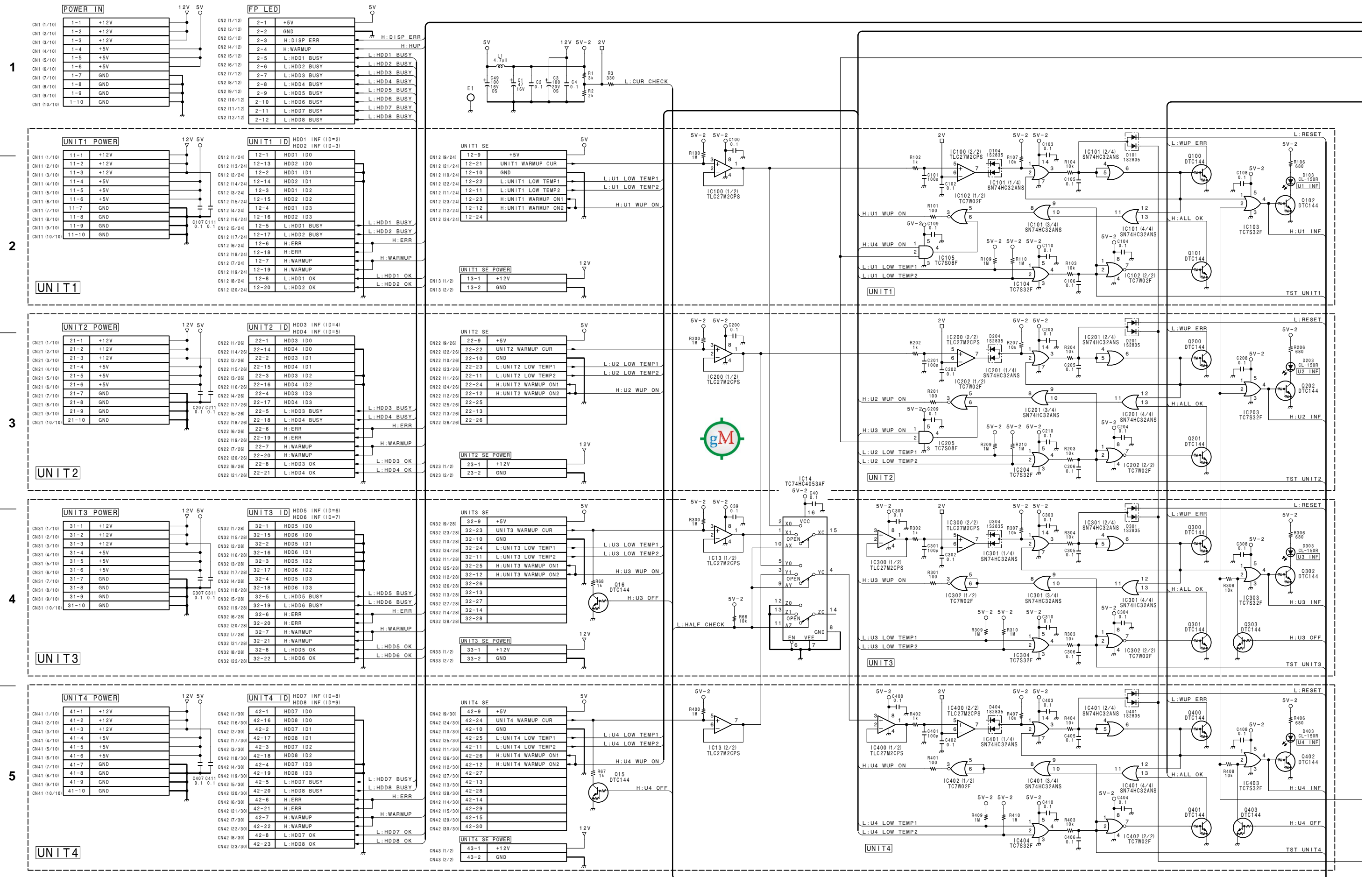




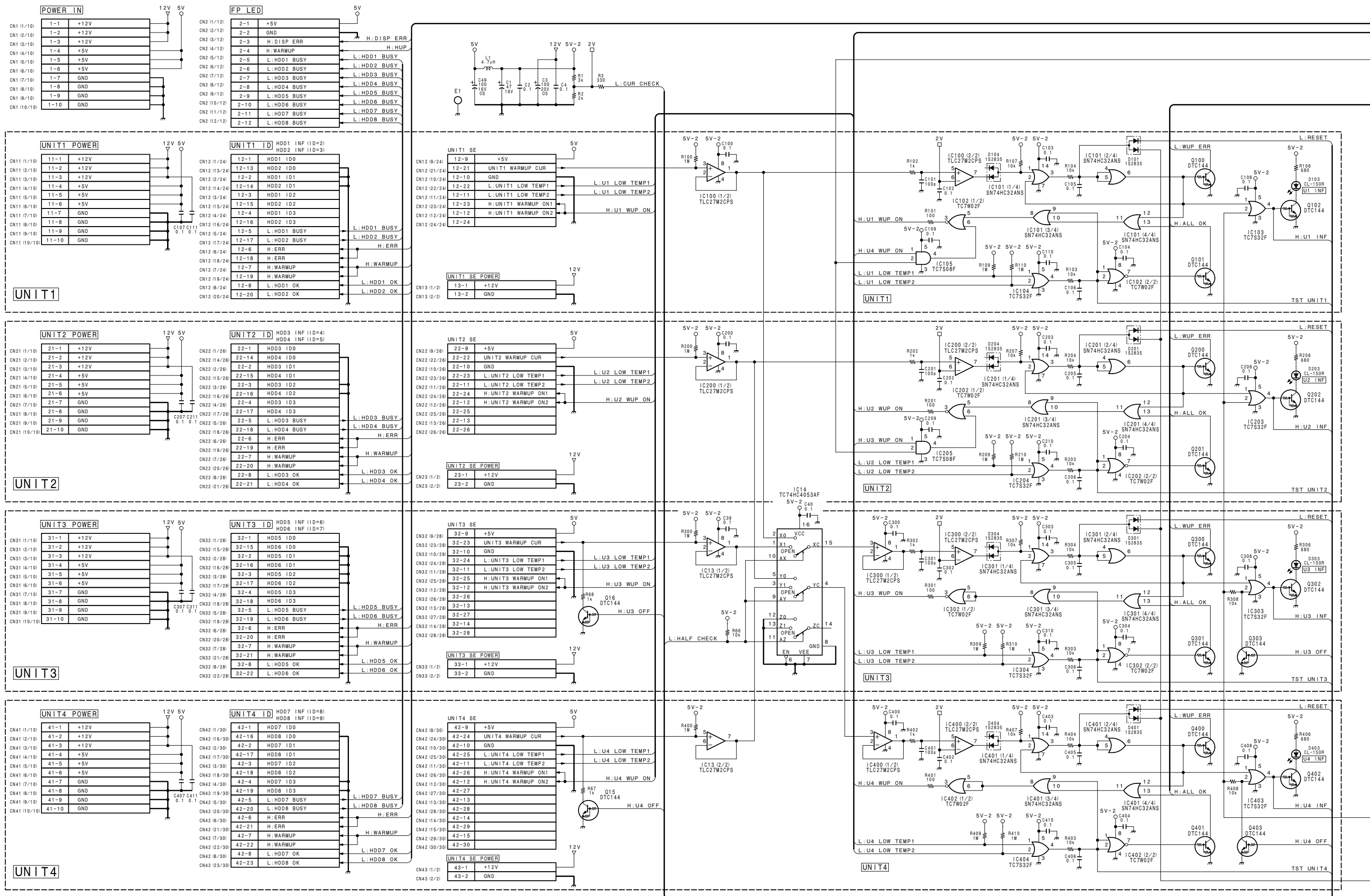
Section 6  
Schematic Diagrams and Frame Wiring



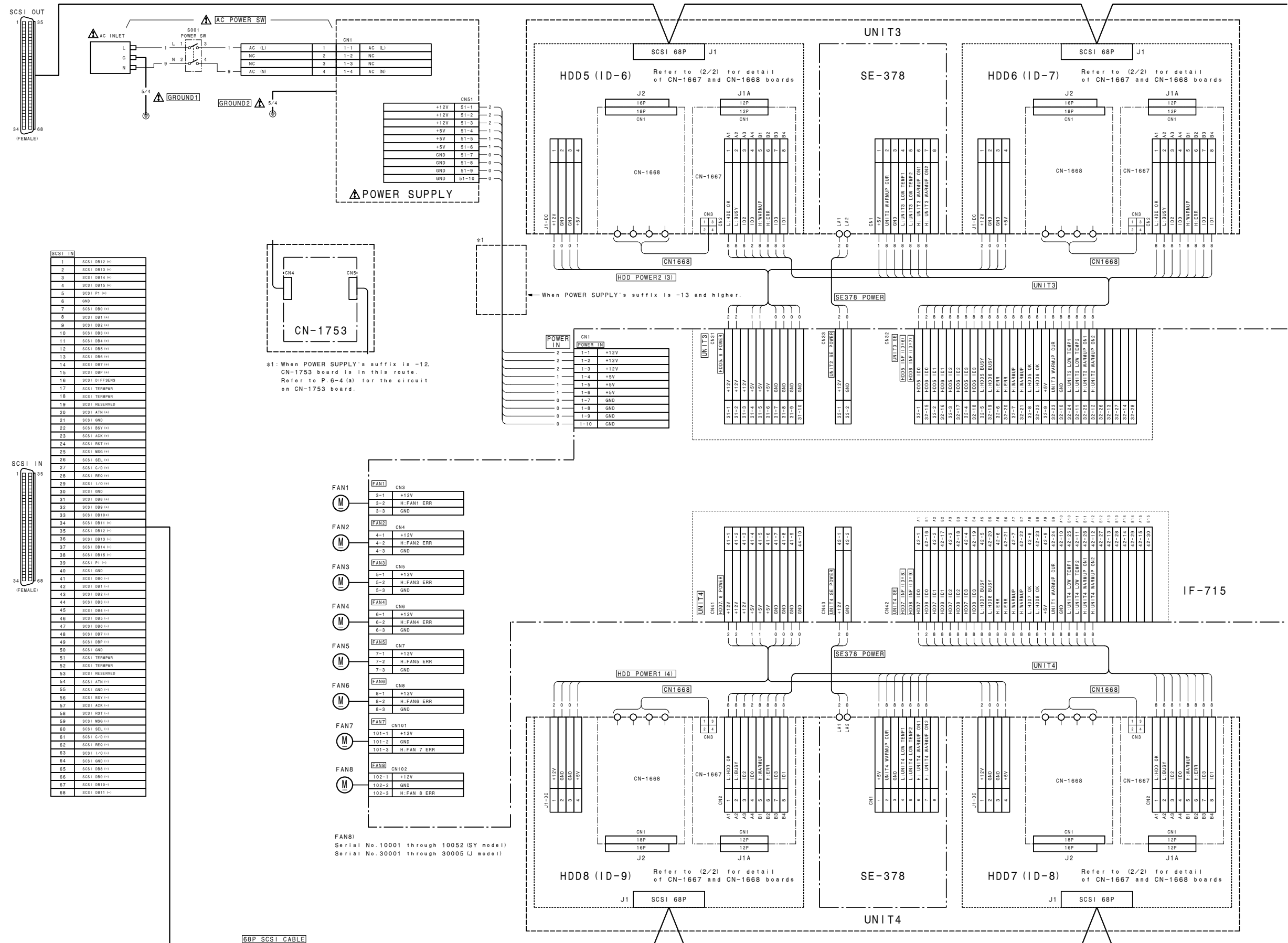
**SE-378**  
BOARD NO. 1-663-883-12  
LOT NO. 605-

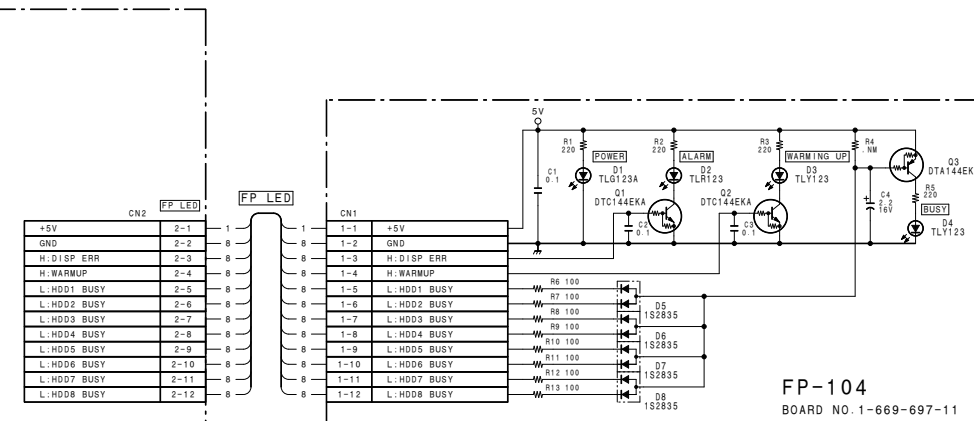
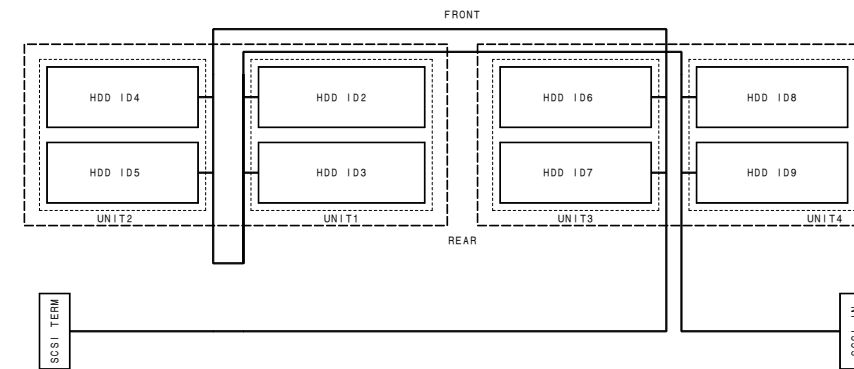
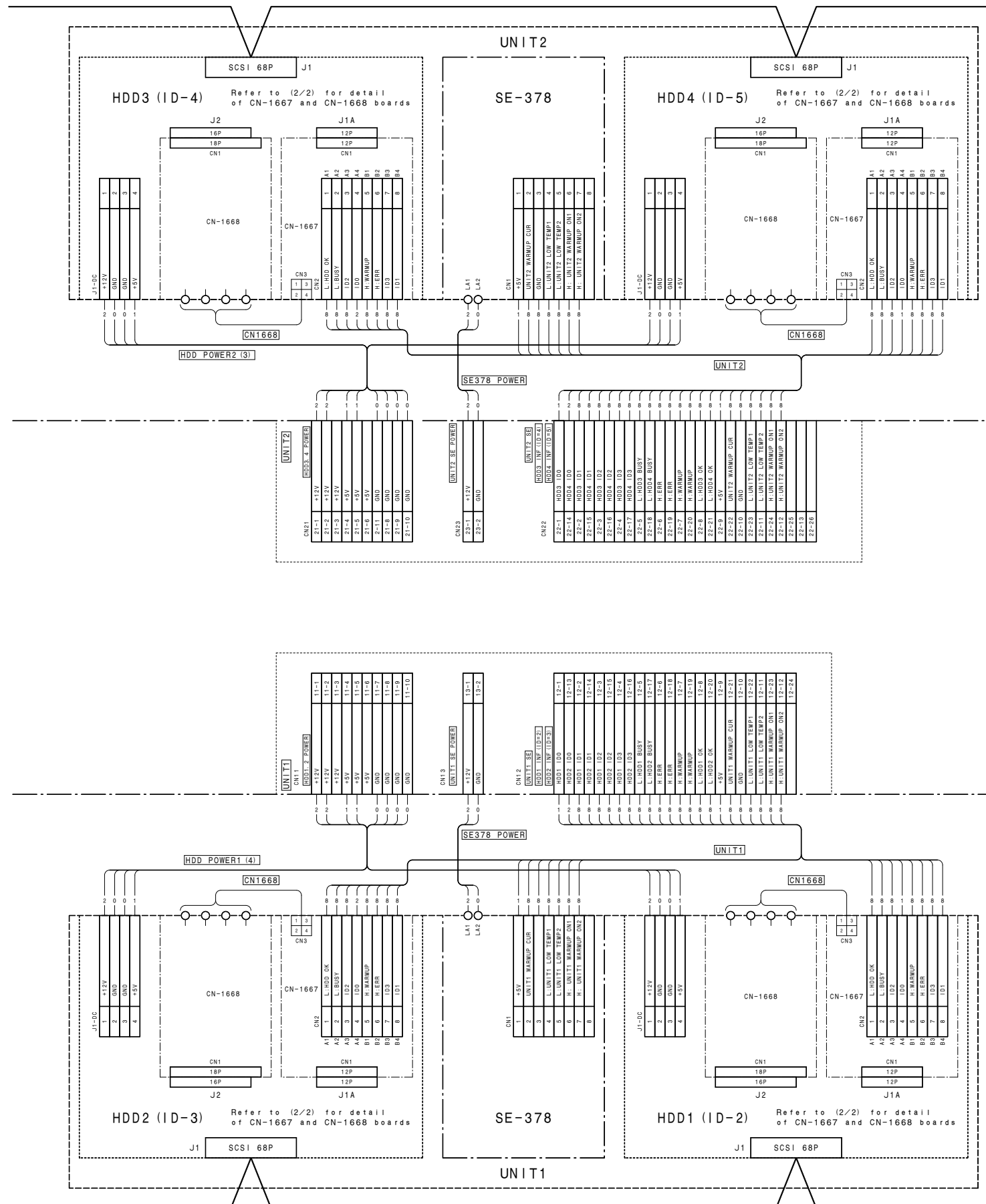




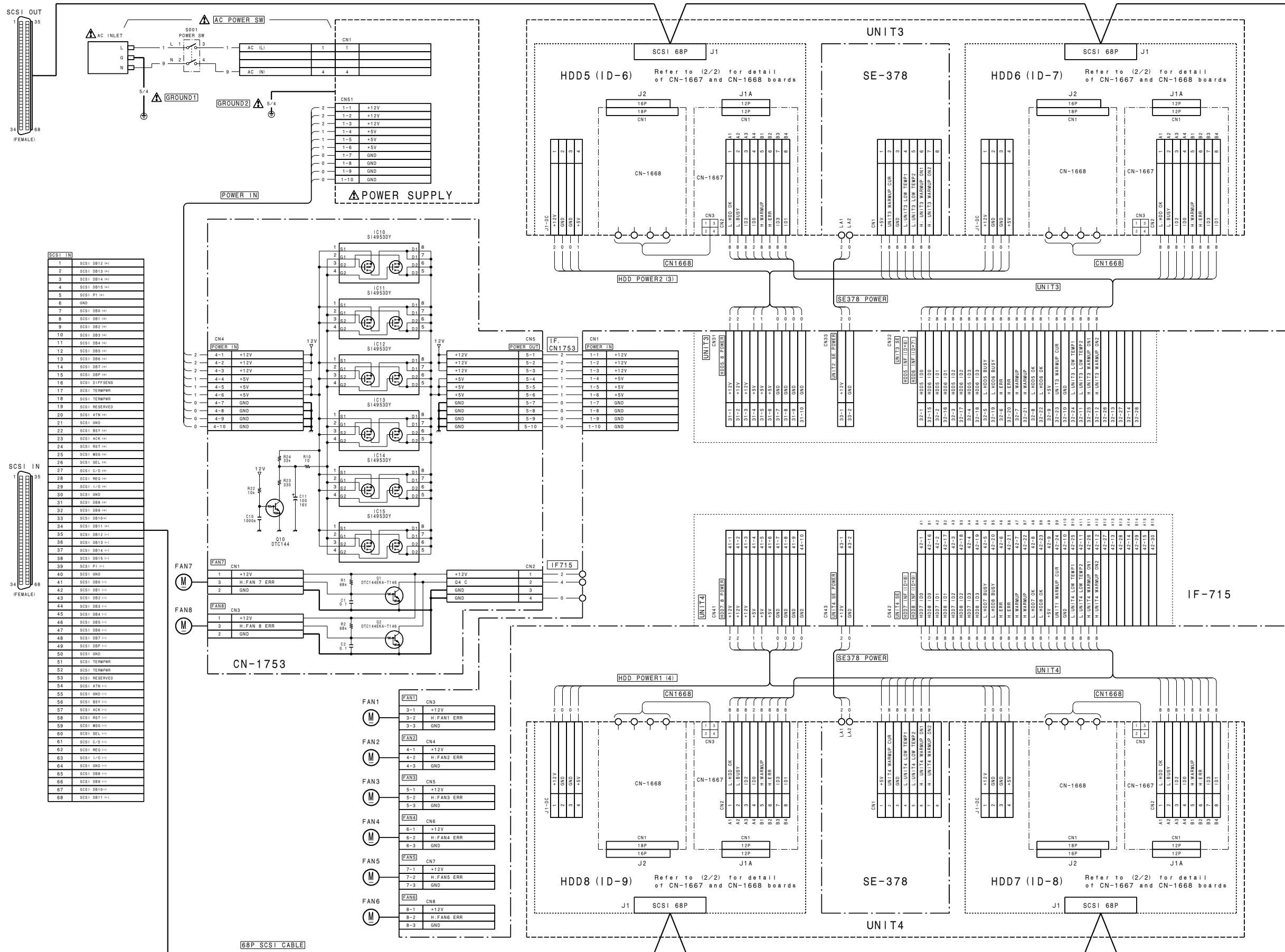




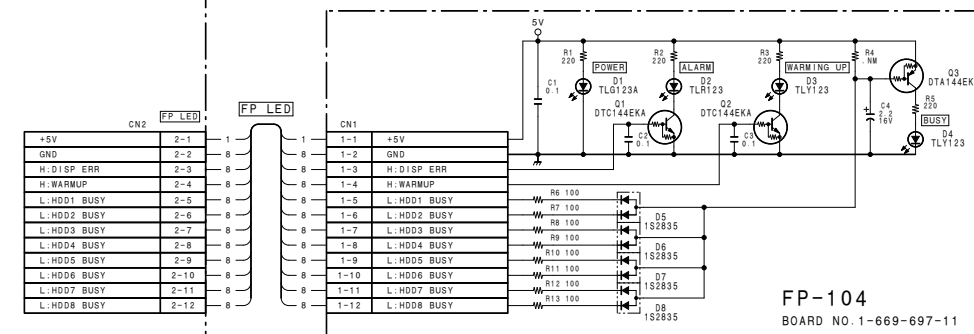
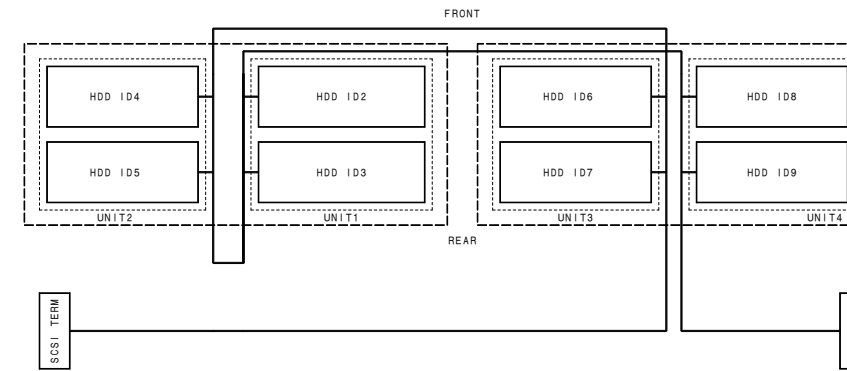
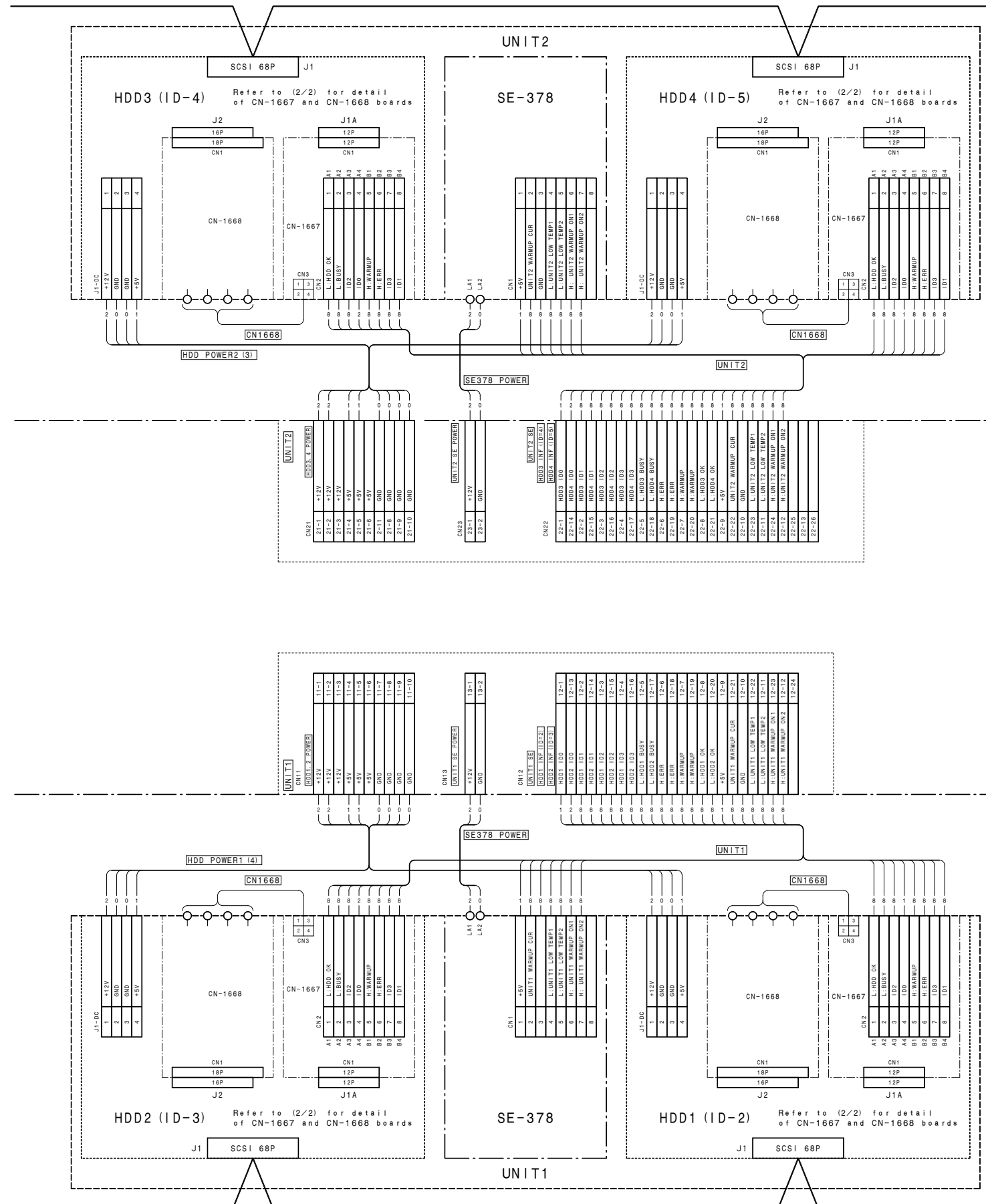




Frame (1/2)  
IF-715 board's suffix is -12 and higher.







## Frame (1/2)

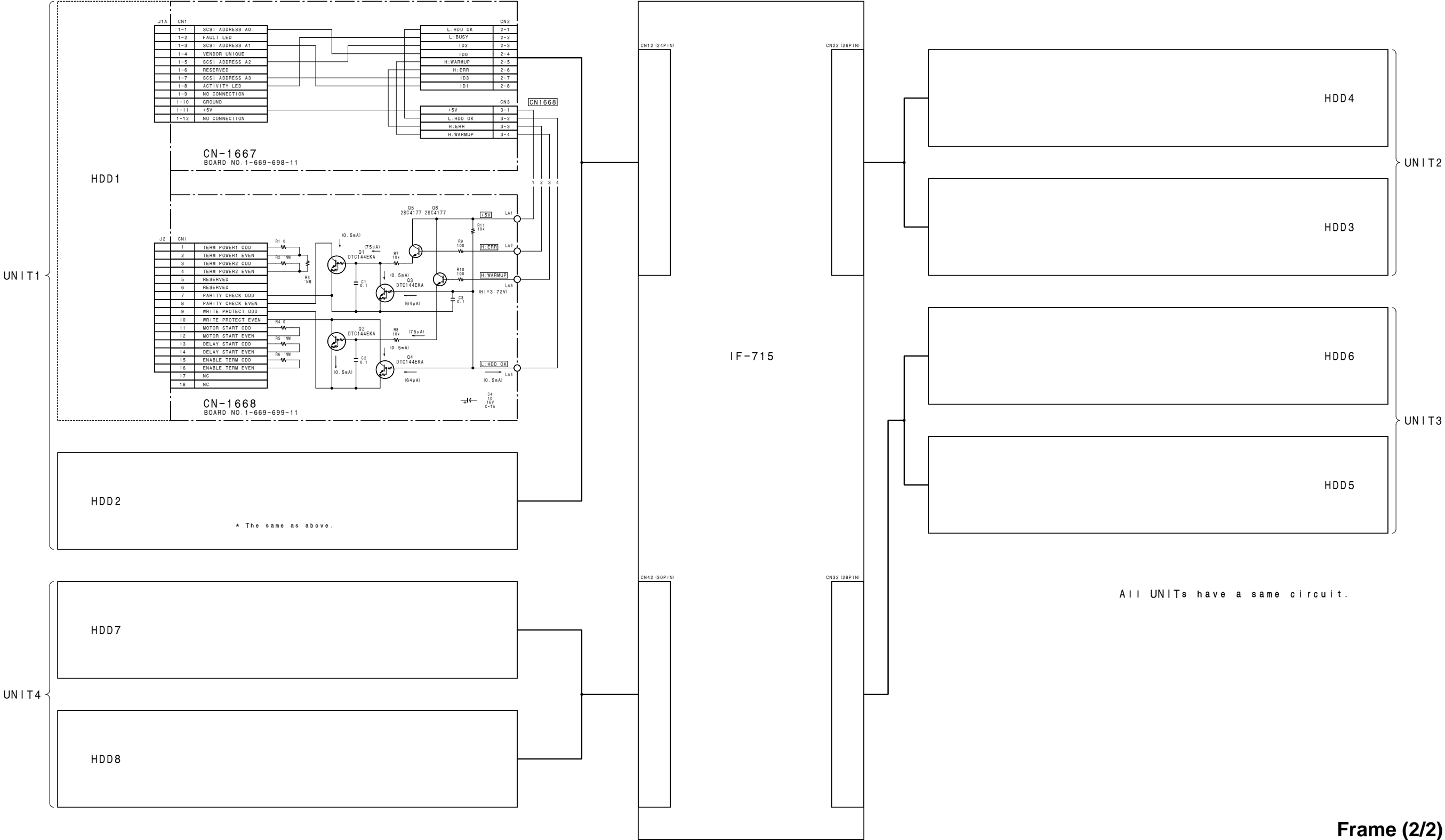
1

2

3

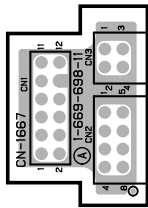
4

5

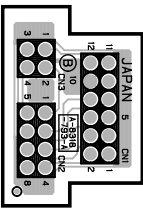


Section 7

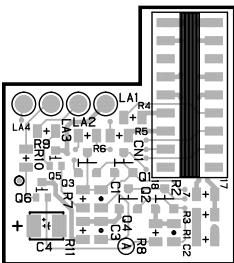
Board Layouts



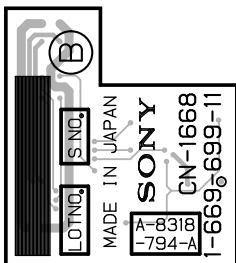
CN-1667 -A SIDE-  
SUFFIX: -11



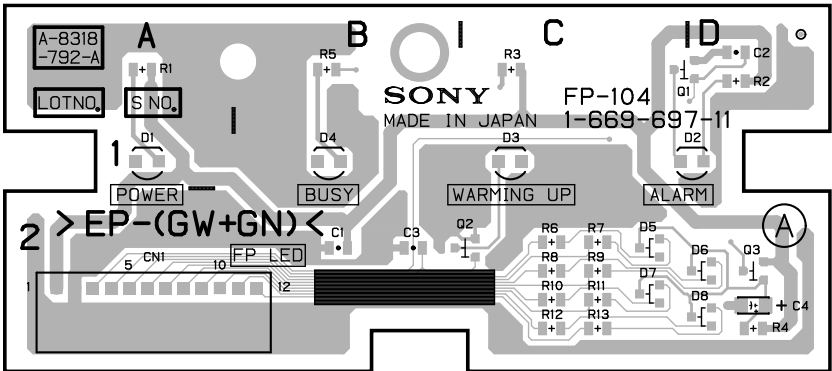
CN-1667 -B SIDE-  
SUFFIX: -11



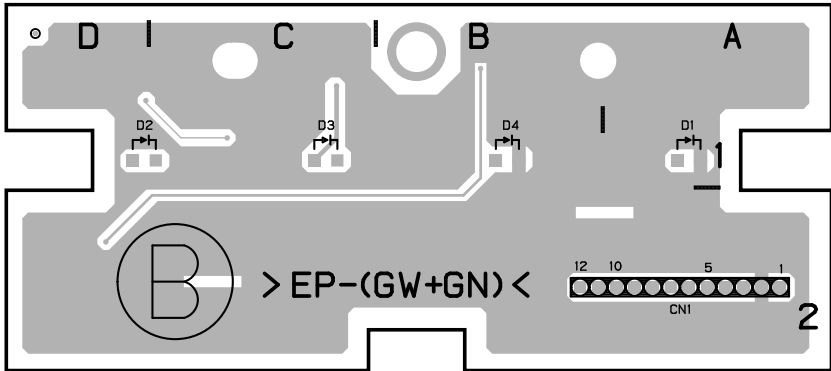
CN-1668 -A SIDE-  
SUFFIX: -11



CN-1668 -B SIDE-  
SUFFIX: -11



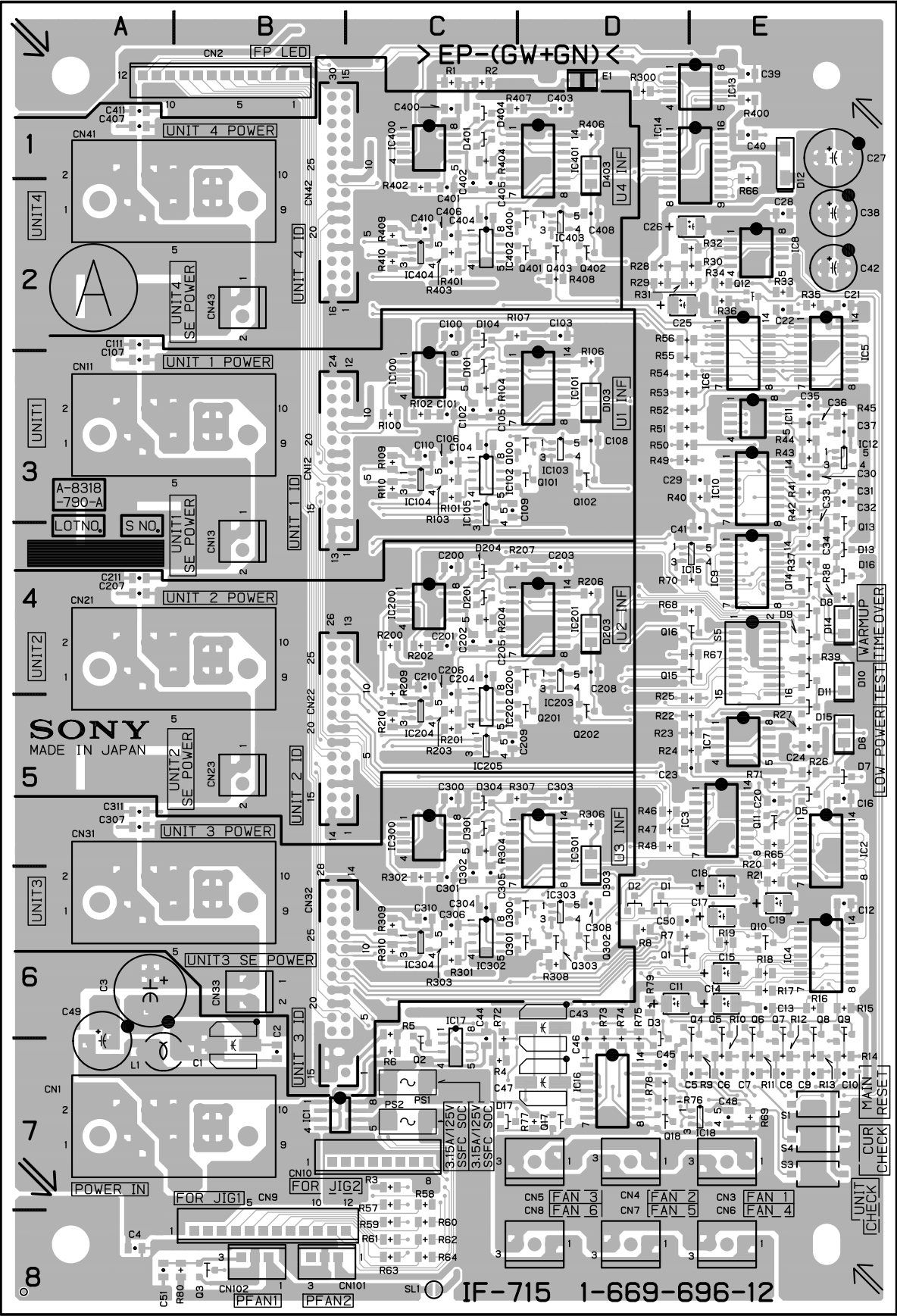
FP-104 -A SIDE-  
SUFFIX: -11



FP-104 -B SIDE-  
SUFFIX: -11

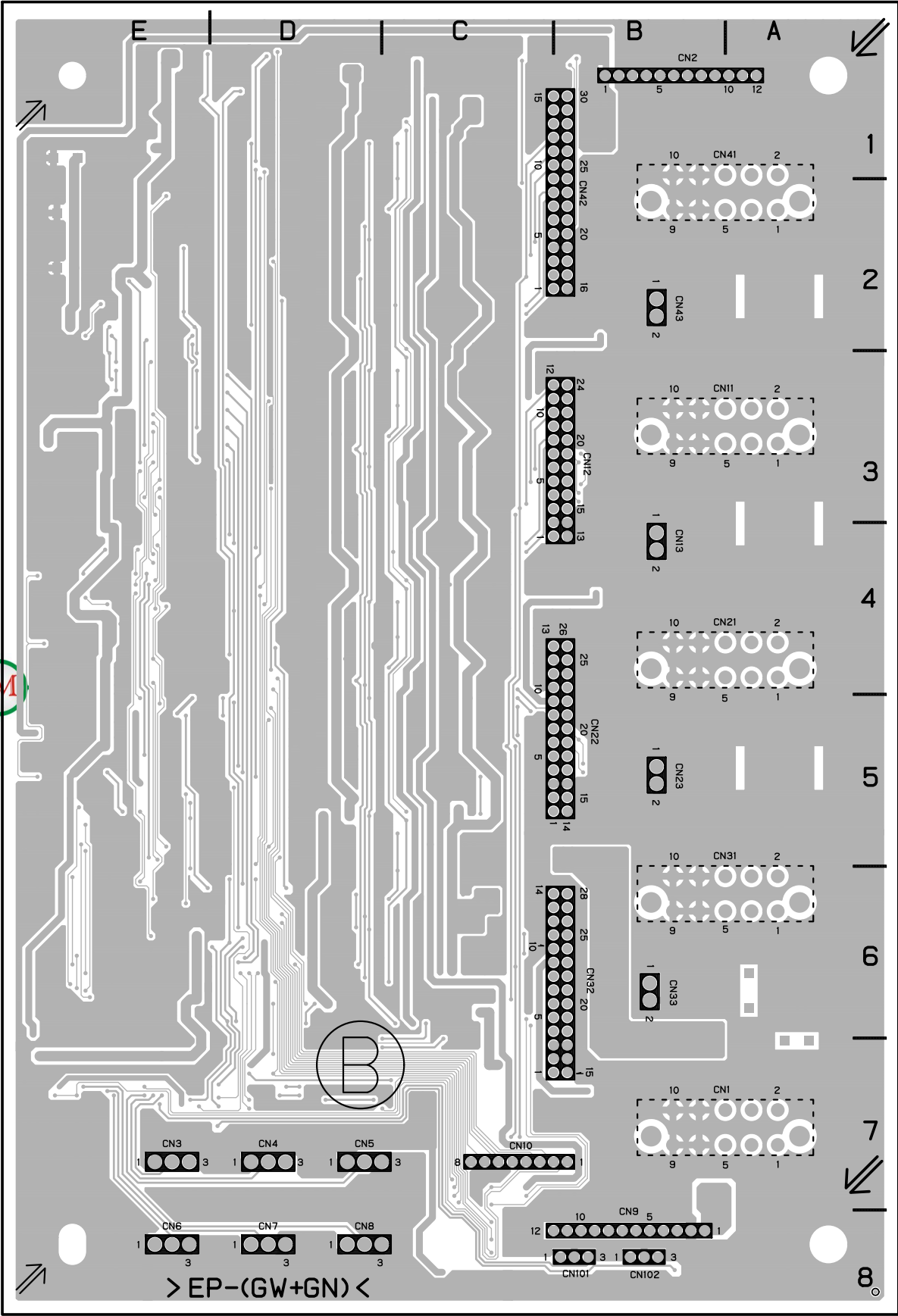
FP-104(1-669-697-11)

C1	B2	R1	A1
C2	D1	R2	D1
C3	B2	R3	C1
C4	D2	R4	D2
		R5	B1
CN1	A2	R6	C2
		R7	C2
D1	A1	R8	C2
D2	D1	R9	C2
D3	C1	R10	C2
D4	B1	R11	C2
D5	C2	R12	C2
D6	D2	R13	C2
D7	C2		
D8	D2		
Q1	C1		
Q2	C2		
Q3	D2		



IF-715 -A SIDE-  
SUFFIX: -12

7-2 (b)



IF-715 -B SIDE-  
SUFFIX: -12

7-2 (b)

IF-715(1-669-696-12)

C1	B7	C405	C2	IC205	C5	R42	E3
C2	B7	C406	C2	IC300	C5	R43	E3
C3	A6	C407	A1	IC301	C5	R44	E3
C4	A8	C408	D2	IC302	C6	R45	E3
C5	E7	C410	C2	IC303	D6	R46	D5
C6	E7	C411	A1	IC304	C6	R47	D5
C7	E7	CN1	A7	IC400	C1	R48	D5
C8	E7	CN2	B1	IC401	C1	R49	D3
C9	E7	CN3	E7	IC402	C2	R50	D3
C10	E7	CN4	D7	IC403	D2	R51	D3
C11	D6	CN5	D7	IC404	C2	R52	D3
C12	E6	CN6	E8			R53	D3
C13	E6	CN7	D8	L1	A7	R54	D3
C14	E6	CN8	D8			R55	D3
C15	E6	CN9	B8	PS1	C7	R56	D2
C16	E5	CN10	C7	PS2	C7	R57	C7
C17	E6	CN11	A3			R58	C7
C18	E6	CN12	B3	Q1	D6	R59	C8
C19	E6	CN13	B4	Q2	C7	R60	C8
C20	E5	CN21	A4	Q3	B8	R61	C8
C21	E2	CN22	B5	Q4	E6	R62	C8
C22	E2	CN23	B5	Q5	E6	R63	C8
C23	E5	CN31	A6	Q6	E6	R64	C8
C24	E5	CN32	B6	Q7	E6	R65	E5
C25	D2	CN33	B6	Q8	E6	R66	E1
C26	E2	CN41	A2	Q9	E6	R67	E4
C27	E1	CN42	B2	Q10	E6	R68	E4
C28	E2	CN43	B2	Q11	E5	R69	E7
C29	E3	CN101	B8	Q12	E2	R70	E4
C30	E3	CN102	B8	Q13	E4	R71	E5
C31	E3			Q14	E4	R72	C7
C32	E3	D1	D6	Q15	E4	R73	D7
C33	E4	D2	D6	Q16	E4	R74	D7
C34	E4	D3	D7	Q17	D7	R75	D7
C35	E3	D5	E5	Q18	D7	R76	D7
C36	E3	D6	E5	Q100	D3	R77	D7
C37	E3	D7	E5	Q101	D3	R78	D7
C38	E2	D8	E4	Q102	D3	R79	D6
C39	E1	D9	E4	Q200	D4	R80	B8
C40	E1	D10	E4	Q201	D5	R100	C3
C41	E4	D11	E4	Q202	D5	R101	C3
C42	E2	D12	E1	Q300	D6	R102	C3
C43	D6	D13	E4	Q301	D6	R103	C3
C44	C7	D14	E4	Q302	D6	R104	C3
C45	D7	D15	E5	Q303	D6	R106	D3
C46	D7	D16	E4	Q400	D2	R107	C2
C47	D7	D17	C7	Q401	D2	R109	C3
C48	E7	D101	C3	Q402	D2	R110	C3
C49	A7	D103	D3	Q403	D2	R200	C4
C50	D6	D104	C2			R201	C5
C51	A8	D201	C4	R1	C1	R202	C4
C100	C2	D203	D4	R2	C1	R203	C5
C101	C3	D204	C4	R3	C7	R204	C4
C102	C3	D301	C5	R4	C7	R206	D4
C103	D2	D303	D5	R5	C6	R207	C4
C104	C3	D304	C5	R6	C7	R209	C4
C105	C3	D401	C1	R7	D6	R210	C5
C106	C3	D403	D1	R8	D6	R300	D1
C107	A3	D404	C1	R9	E7	R301	C6
C108	D3			R10	E7	R302	C6
C109	C3	E1	D1	R11	E7	R303	C6
C110	C3			R12	E7	R304	C5
C111	A2	IC1	B7	R13	E7	R306	D5
C200	C4	IC2	E5	R14	E7	R307	C5
C201	C4	IC3	E5	R15	E6	R308	D6
C202	C4	IC4	E6	R16	E6	R309	C6
C203	D4	IC5	E2	R17	E6	R310	C6
C204	C4	IC6	E2	R18	E6	R400	E1
C205	C4	IC7	E5	R19	E6	R401	C2
C206	C4	IC8	E2	R20	E5	R402	C2
C207	A4	IC9	E4	R21	E6	R403	C2
C208	D4	IC10	E3	R22	E5	R404	C1
C209	C5	IC11	E3	R23	E5	R406	D1
C210	C4	IC12	E3	R24	E5	R407	C1
C211	A4	IC13	D1	R25	E5	R408	D2
C300	C5	IC14	D1	R26	E5	R409	C2
C301	C6	IC15	E4	R27	E5	R410	C2
C302	C6	IC16	D7	R28	D2		
C303	D5	IC17	C7	R29	D2	S1	E7
C304	C6	IC18	E7	R30	E2	S3	E7
C305	C6	IC100	C3	R31	E2	S4	E7
C306	C6	IC101	C3	R32	E2	S5	E4
C307	A5	IC102	C3	R33	E2	SL1	C8
C308	D6	IC103	D3	R34	E2		
C310	C6	IC104	C3	R35	E2		
C311	A5	IC105	C3	R36	E2		
C400	C1	IC200	C4	R37	E4		
C401	C2	IC201	C4	R38	E4		
C402	C2	IC202	C5	R39	E4		
C403	D1	IC203	D4	R40	E3		
C404	C2	IC204	C5	R41	E3		



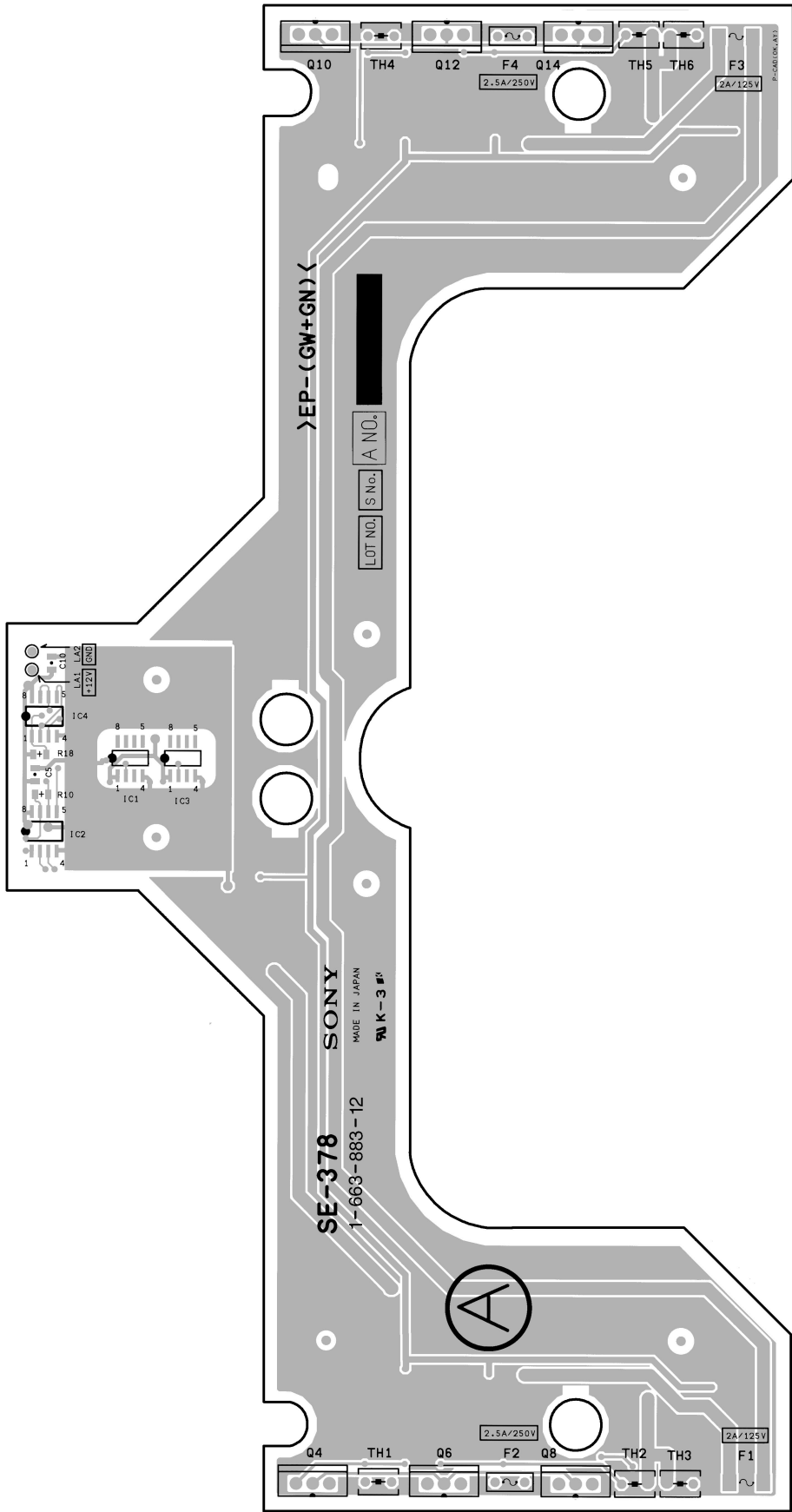
7-2 (a)



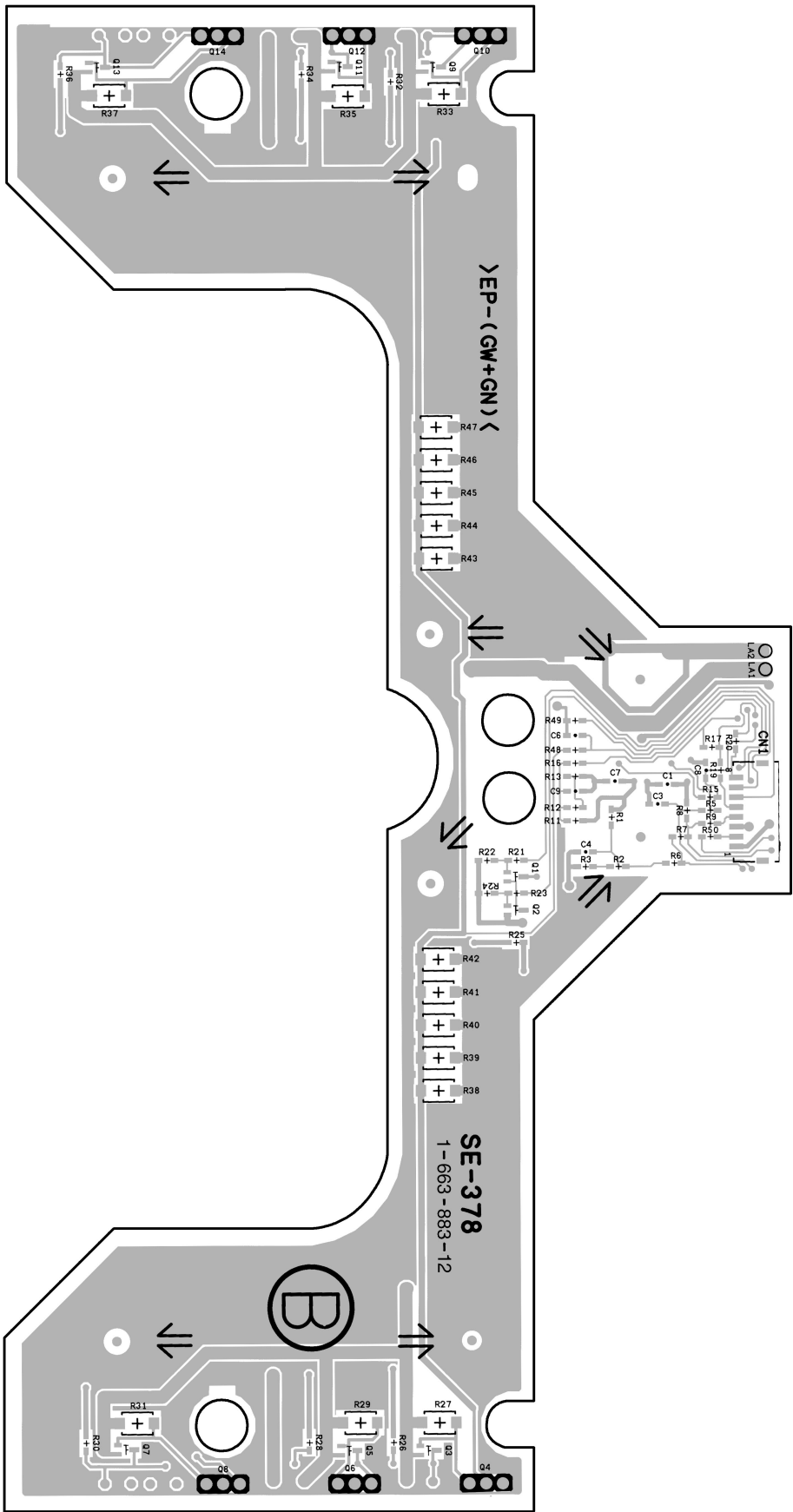
7-2 (a)

IF-715(1-669-696-11)

C1	B6	CN7	D8	PS2	C7	R61	C8
C2	B7	CN8	D8			R62	C8
C3	A6	CN9	B8	Q2	C7	R63	C8
C4	A8	CN10	C7	Q4	E6	R64	C8
C5	E7	CN11	A3	Q5	E6	R65	E5
C6	E7	CN12	B3	Q6	E6	R66	E1
C7	E7	CN13	B4	Q7	E6	R67	E4
C8	E7	CN21	A4	Q8	E6	R68	E4
C9	E7	CN22	B5	Q9	E6	R69	E7
C10	E7	CN23	B5	Q10	E6	R70	E4
C12	E6	CN31	A6	Q11	E5	R71	E5
C13	E6	CN32	B6	Q12	E2	R72	C7
C14	E6	CN33	B6	Q13	E4	R73	D7
C15	E6	CN41	A2	Q14	E4	R74	D7
C16	E5	CN42	B2	Q15	E4	R75	D7
C17	E6	CN43	B2	Q16	E4	R76	D7
C18	E6			Q17	D7	R77	D7
C19	E6	D1	D6	Q18	D7	R78	D7
C20	E5	D2	D6	Q100	D3	R100	C3
C21	E2	D3	D7	Q101	D3	R101	C3
C22	E2	D5	E5	Q102	D3	R102	C3
C23	E5	D6	E5	Q200	D4	R103	C3
C24	E5	D7	E5	Q201	D5	R104	C3
C25	D2	D8	E4	Q202	D5	R106	D3
C26	E2	D9	E4	Q300	D6	R107	C2
C27	E1	D10	E4	Q301	D6	R109	C3
C28	E2	D11	E4	Q302	D6	R110	C3
C29	E3	D12	E1	Q303	D6	R200	C4
C30	E3	D13	E4	Q400	D2	R201	C5
C31	E3	D14	E4	Q401	D2	R202	C4
C32	E3	D15	E5	Q402	D2	R203	C5
C33	E4	D16	E4	Q403	D2	R204	C4
C34	E4	D17	C7			R206	D4
C35	E3	D101	C3	R1	C1	R207	C4
C36	E3	D103	D3	R2	C1	R209	C4
C37	E3	D104	C2	R3	C7	R210	C5
C38	E2	D201	C4	R4	C7	R300	D1
C39	E1	D203	D4	R5	C6	R301	C6
C40	E1	D204	C4	R6	C7	R302	C6
C41	E4	D301	C5	R8	D6	R303	C6
C42	E2	D303	D5	R9	E7	R304	C5
C43	D6	D304	C5	R10	E7	R306	D5
C44	C7	D401	C1	R11	E7	R307	C5
C45	D7	D403	D1	R12	E7	R308	D6
C46	D7	D404	C1	R13	E7	R309	C6
C47	D7			R14	E7	R310	C6
C48	E7	E1	D1	R15	E6	R400	E1
C100	C2			R16	E6	R401	C2
C101	C3	IC1	B7	R17	E6	R402	C2
C102	C3	IC2	E5	R18	E6	R403	C2
C103	D2	IC3	E5	R19	E6	R404	C1
C104	C3	IC4	E6	R20	E5	R406	D1
C105	C3	IC5	E2	R21	E6	R407	C1
C106	C3	IC6	E2	R22	E5	R408	D2
C108	D3	IC7	E5	R23	E5	R409	C2
C109	C3	IC8	E2	R24	E5	R410	C2
C110	C3	IC9	E4	R25	E5		
C200	C4	IC10	E3	R26	E5	S1	E7
C201	C4	IC11	E3	R27	E5	S3	E7
C202	C4	IC12	E3	R28	D2	S4	E7
C203	D4	IC13	D1	R29	D2	S5	E4
C204	C4	IC14	D1	R30	E2		
C205	C4	IC15	E4	R31	E2		
C206	C4	IC16	D7	R32	E2		
C208	D4	IC17	C7	R33	E2		
C209	C5	IC18	E7	R34	E2		
C210	C4	IC100	C3	R35	E2		
C300	C5	IC101	C3	R36	E2		
C301	C6	IC102	C3	R37	E4		
C302	C6	IC103	D3	R38	E4		
C303	D5	IC104	C3	R39	E4		
C304	C6	IC105	C3	R40	E3		
C305	C6	IC200	C4	R41	E3		
C306	C6	IC201	C4	R42	E3		
C308	D6	IC202	C5	R43	E3		
C310	C6	IC203	D4	R44	E3		
C400	C1	IC204	C5	R45	E3		
C401	C2	IC205	C5	R46	D5		
C402	C2	IC300	C5	R47	D5		
C403	D1	IC301	C5	R48	D5		
C404	C2	IC302	C6	R49	D3		
C405	C2	IC303	D6	R50	D3		
C406	C2	IC304	C6	R51	D3		
C408	D2	IC400	C1	R52	D3		
C410	C2	IC401	C1	R53	D3		
		IC402	C2	R54	D3		
CN1	A7	IC403	D2	R55	D3		
CN2	B1	IC404	C2	R56	D2		
CN3	E7			R57	C7		
CN4	D7	L1	A6	R58	C7		
CN5	D7			R59	C8		
CN6	E8	PS1	C7	R60	C8		



SE-378 -A SIDE-  
SUFFIX: -12



SE-378 -B SIDE-  
SUFFIX: -12

SE-378(1-663-883-12)	
C1	*A1
C3	*A1
C4	*A1
C5	A1
C6	*A1
C7	*A1
C8	*A1
C9	*A1
C10	A1
CN1	*A1
F1	A1
F2	A1
F3	A1
F4	A1
IC1	A1
IC2	A1
IC3	A1
IC4	A1
Q1	*A1
Q2	*A1
Q3	*A1
Q4	A1
Q5	*A1
Q6	A1
Q7	*A1
Q8	A1
Q9	*A1
Q10	A1
Q11	*A1
Q12	A1
Q13	*A1
Q14	A1
R1	*A1
R2	*A1
R3	*A1
R5	*A1
R9	*A1
R10	A1
R11	*A1
R12	*A1
R13	*A1
R15	*A1
R19	*A1
R20	*A1
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R41	*A1
R42	*A1
R43	*A1
R44	*A1
R45	*A1
R46	*A1
R47	*A1
R48	*A1
R49	*A1
R50	*A1
TH1	A1
TH2	A1
TH3	A1
TH4	A1
TH5	A1
TH6	A1

\*: B SIDE



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## For the U.S.A. and Canada

### SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer :

Check the metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

### LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 3.5 mA. Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 5.25 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 20 V AC range are suitable. (See Fig. A)

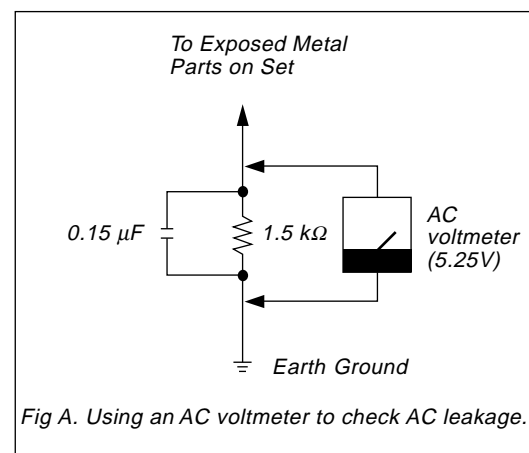


Fig A. Using an AC voltmeter to check AC leakage.

